Value for Money Integration in the Renegotiation of Public Private Partnership Road Projects

By

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STUDENT DECLARATION

I declare that while registered as a candidate for the research degree, I have not been a registered candidate or enrolled student for another award of the University or other academic or professional institution

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ABSTRACT

The governments of various countries have continued to adopt Public Private Partnership (PPP) for infrastructure projects delivery due to its many advantages over the traditional procurement method. However, concerns have been raised by stakeholders about the viability of PPP to deliver Value for Money (VfM), especially for the client. These discussions have generated debates and arguments in policy and advisory documents within the last decade mainly in the renegotiation of PPP water and transport projects and their VfM implications. Poor or non-achievement of VfM in PPP contracts renegotiation has led to this study in PPP road projects with the overall aim of integrating VfM considerations into the renegotiation process of PPP road projects.

Mixed methodology research approach is used to achieve the objectives set for the study. Interviews and questionnaires of professionals involved in Design-Build-Finance-Operate (DBFO) road projects in the UK are used in the study. The qualitative and quantitative analysis of the data collected revealed that technical, contractual and additional works are the categories of factors leading to renegotiations and have an impact on the achievement of VfM. These findings show that renegotiation does not necessarily have to erode the VfM benefits of PPP road projects for the client and lead to user's dissatisfaction regarding quality, fees, and charges. The research shows that the very critical factors leading to the renegotiation of road concessions are changes to works standards, specifications, the scope of works, and additional works. The findings also indicate that design and planning measures such as clear and concise contract documents, a definition of detailed criteria for VfM and performance indicators, and accurate estimation of contract requirements amongst others are critical measures to ensure the achievement of VfM at the renegotiation of PFI (DBFO) road projects. Also, VfM can further be achieved for the renegotiations that are predominantly motivated by technical and contractual factors.

This study developed a VfM renegotiation framework for the UK PFI (DBFO) road projects. The five constituents of the VfM renegotiation framework are identification and establishment of measures and mechanisms, the factors leading to renegotiation and their level of criticalities, impacts of the renegotiation on VfM criteria, the identification of renegotiation outcomes and their natures and the application of remedial actions (if necessary). The concept of the framework is premised on the importance of defining and agreeing on appropriate measures and VfM contractual mechanisms by both public and private stakeholders at the contract inception to guide future renegotiation. An assessment of the factors, impacts, and outcomes of the renegotiation is necessary during the stages of implementation of the PPP road projects to develop an understanding of the implications of the renegotiation on VfM.

The knowledge of the impacts of renegotiations during implementation will inform the responsible stakeholder's decision on the appropriate actions required to address any observed deviations from the project performance indicators or value for money criteria defined at the inception of the contract. The public and private partners can achieve their respective VfM objectives while also achieving user's satisfaction through the adoption of the proposed VfM renegotiation framework. There is, however, a need for the public and private partners who will be the primary beneficiary of the framework to be proactively involved in the use of the framework from contract inception to handing over of the project residual value to the client. The formulation of measures for renegotiation at the outset of the contract as indicated in the framework is essential to achieving VfM at renegotiation. Also, the client should ensure that flexibility is built into the agreement regarding the contract mechanisms for payment from the beginning, to allow either party to introduce proposals that can enhance the achievement of VfM at renegotiation or change negotiation.

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LIST OF ABREVIATIONS

ANOVA: Analysis of Variance

CS: Case Study

CS1: Case Study 1

CS2: Case Study 2

CS3: Case Study 3

CS4: Case Study 4

CS5: Case Study 5

CCTV: Closed Circuit Television

C: Critical

DBFO: Design-Build-Finance-Operate

DoT: Department of Transport

EIB: European Investment Bank

HGV: Heavy Goods Vehicle

HM: Her Majesty

Km: Kilometres

LAC: Latin America and Caribbean

LR: Literature Review

MC: Moderately Critical

(£) M: Great Britain Pound in Millions

NAO: National Audit Office

NC: Non-Critical

NPV: Net Present Value

O & M: Operation and Maintenance

PPP: Pubic Private Partnership

PPI: Private Participation in Infrastructure

PFI: Private Finance Initiative

PF2: Private Finance 2

PSC: Public Sector Comparator

RRB: Resource, Risk and Benefit

SPV: Special Purpose Vehicle

UK: United Kingdom

US: United States

VC: Very Critical

VfM: Value for Money

VfMR: Value for Money Renegotiation

VfMRF: Value for Money Renegotiation Framework

VR1-Pri: Validation Respondent 1 currently working in the private sector

VR2-Pub: Validation Respondent 2 currently working in the public sector

VR3-Pub: Validation Respondent 3 currently working in the public sector

VR4-Pri: Validation Respondent 4 currently working in the private sector

VR5- Pri: Validation Respondent 5 currently working in the private sector

VR6-Pri: Validation Respondent 6 currently working in the private sector

VR7-Pri: Validation Respondent 7 currently working in the private sector

XY1-Pub: Respondent XY1 in the public sector.

XY2-Pri: Respondent XY2 in the private sector.

XY3-Pub: Respondent XY3 in the public sector.

XY4-Pub: Respondent XY4 in the public sector.

XY5-Pri: Respondent XY5 in the private sector.

XY6-Pri: Respondent XY6 in the private sector.

XY7-Pub: Respondent XY7 in the public sector.

XY8-Pub: Respondent XY8 in the public sector.

XY9-Pri: Respondent XY9 in the private sector.

Yrs.: Years

CHAPTER 1 INTRODUCTION

1.1 BACKGROUND OF THE RESEARCH

Transport infrastructure has been recognised as a significant contributor to economic growth and social development in academic and policy discussions (Tomova, 2008) and a crucial means of shaping the destiny of many nations (Adetola et al., 2011). The need for adequate and efficient transport infrastructure has prompted various governments of countries to devise ways and forms of procurement, which would ensure free and safe means of transportation in the most economical terms (Chowdhury, 2011, Meidute, 2011; Biau et al.; 2008). This need has led most developed countries and some developing nations to adopt Public Private Partnerships (PPP) during the delivery of transport infrastructures, particularly road projects.

The reasons for the adoption of PPP by governments include the use of private funds for public infrastructure provision, financial risk transfer to the private partner and utilisation of higher management expertise of the private sector (Verweij, 2015; Tsamboulas et al., 2013; Chinyio 2005). All these reasons suggest that there is need to adopt PPP to foster the effective and efficient delivery of infrastructure projects. The provision of transport projects to achieve economic efficiency means the achievement of value for money (VfM) especially for the stakeholders, which is the principal objective of the procuring authority in any PPP initiative (Henjewele, 2011).

Adair et al. (2011, p. 9) opine, *"the rollout of the PPP models has not met with universal approval; indeed, in some countries, there has been strong resistance to public-private partnerships with misgivings centred on the level of private sector profiteering as well as long-term obligations placed on the taxpayer".* This suggests that the delivery of infrastructure projects through PPP has not gained universal acceptance especially the acceptance of the users and members of the public. Also, regardless of the reasons for the adoption of PPP, particularly in the transport sector, which is premised on the benefits derived from its use, there have been obvious challenges that have hindered the successful implementation of the model especially in terms of VfM (Sarmento, 2014; Nikolaidis and Roumboutsos, 2013; Athias and Saussier, 2007). The challenges can also be regarded as setbacks and constitute issues in PPP procurement. These challenges include incomplete contracting, project abandonment, cost and time overruns and renegotiation (Guasch et al., 2014; Amade, 2012; Guasch and Straub, 2009b; Estache et al., 2009). However, one of the main setbacks of PPP, which have severe implications, is renegotiation of the contract (Guasch et al., 2014; Sarmento, 2014; Estache et al., 2009; Guasch and Straub, 2009a).

Carrillo et al. (2008) corroborate the findings of this literature by identifying the issues that are associated with Private Finance Initiative (PFI). These problems include affordability gaps, insufficient staff resources by the public client, matters relating to design change (i.e., orders/variations), questions on the establishment of life-cycle costs, and concerns regarding the sustenance of the service level by the private sector during the operation of completed facilities. These implementation challenges according to the literature have overarching implications for the project stakeholders (Khan, 2014; Verweij, 2014; Rouhani, 2009). The main renegotiation question of PPP infrastructure projects is in terms of the achievement of VfM, especially for the client (Guasch et al.,2014; Sarmento 2014). Guasch et al. (2014, p 6) define renegotiation of PPP contracts as *"involving a change in the original contractual terms and conditions, as opposed to an adjustment in the payments (or tariffs) that takes place under a mechanism defined in the contract."* Guasch & Straub (2009) infer that there is a renegotiation of the concession contract when a significant change not envisioned in the original contract lead to a change in the contract conditions. Thus, renegotiation constitutes a change in the risk matrix assignment of the contract, which could be in scope of the project, specifications, or standard of the works (Makovsek et al., 2015).

Evidence from the literature indicates high incidences of renegotiations in PPP water and transport sector projects compared to other infrastructure construction projects (Nikolaidis and Roumboutsos, 2013; Estache et al., 2009; Guasch and Straub, 2009). The literature has numerous instances of renegotiation experiences of PPP projects in the transport sector (Guasch et al., 2014; Sarmento, 2014; Nikolaidis and Roumboutsos, 2013; Acerete et al., 2010; Baeza and Vassallo, 2010). These studies uncover the incidences involving renegotiations of respective modes of transport, outcomes of the renegotiation and its impacts on the stakeholder's objectives. The studies also reveal that the outcomes of renegotiations of transportation projects have, in most instances resulted in governments supporting the transport concessions via subsidies to the private sector. This practice has, in turn, generated higher charges for road users and questions the ability of PPP to deliver VfM for the public sector (Sarmento, 2014; Guasch et al., 2014; Acerete et al., 2010; Baeza and Vassallo, 2010). Hence, renegotiation in PPP projects, especially involving roads, has an impact on public sector objectives and users' interest.

Most renegotiations in the transport sector (road inclusive) have addressed the viability of the concession contracts to ensure a profitable return to the private sector towards the success of the partnership (Acerete et al., 2009). This situation supports the submissions of recent academic research papers that highlight PPP renegotiations within the transport sector have not achieved VfM for the public sector amongst other infrastructure sectors (Sarmento 2014; Guasch and Straub, 2009b; Hodge and Greve 2009; Flyvbjerg et al., 2004). The evidence of these pieces of

the literature reveals that road projects have the highest percentage of renegotiations in comparison to all other PPP transport projects across various countries. Take, for instance, the road projects renegotiation in Latin America (Guasch et al., 2014; Bitran et al., 2013; Guasch et al., 2008a), Portugal (Sarmento, 2014), Spain (Acerete et al., 2009), Greece (Nikolaidis and Roumboutsos, 2013) and USA (Gifford et al., 2014). The high frequency of PPP road projects renegotiations is observed to be attributable to some factors among which are: inaccurate evaluation of traffic levels and opportunistic behaviours etc. (Trebilcock and Rosenstock, 2015; Nikolaidis et al., 2013). Moreover, weak or inadequate regulatory policy, poor evaluation of bid and bidding errors, and submission of opportunistic bids with the intent of renegotiating the contract during project implementation are among the prominent factors leading to PPP road project renegotiation (Guasch et al., 2014; Bi and Wang 2011).

The literature has identified that the high incidences of renegotiations in PPP road projects have enormous implication on the achievement of VfM (Sarmento, 2014; Bitran et al., 2013; Nikolaidis & Roumboutsos, 2013). These high incidences of renegotiation in PPP road projects and its consequences on the achievement of VfM make it imperative for integration of VfM considerations into a renegotiation of PPP road projects. The basis for the integration of VfM considerations into the renegotiations of PPP road projects is to foster successful implementation of road contracts towards the achievement of VfM for the stakeholders, especially the procuring client.

1.2 STATEMENT OF THE PROBLEM

Renegotiation of PPP road projects has been an important issue that has generated concerns in PPP procurement over the last decade. The high incidences of contract renegotiations give credence to these (Guasch et al., 2014; Sarmento, 2014; Nikolaidis and Roumboutsos, 2013; Acerete et al. 2010). The outcome of the respective cases of PPP infrastructure project renegotiation has resulted in most instances to non-achievement of VfM for the public sector (Sarmento, 2014). Cruz and Marques (2013a) state that contracts renegotiation usually occurs within few years or after the financial close and evidence in the literature reveal that the results do not protect the public interest.

Engel et al. (2014a) in a recent study, also show that road projects account for 54.4% of PPP contracts renegotiation of the total 30% renegotiated projects. These suggest that the road projects have a high percentage of renegotiation in comparison to other modes of the transport sector. The percentage of road projects renegotiation gives credence that research into PPP road projects is viable. Moreover, findings of the ongoing research can be generalised for the transport sector adoption based on the 56% PPP road projects reaching financial close across the developing

world, which is worth 49% of the total investment in the transport sector (PPI Database, 2016). This suggests that research into PPP road projects is considered robust for transportation industry application.

Recent evidence from the literature suggests that renegotiation has had significant influence in the transport and water sectors of some Latin American countries (Guasch and Straub, 2009). Sarmento (2014) substantiate this finding by revealing that more renegotiations occur in PPP contracts during periods of higher corruption. Guasch and Straub (2009) identify a corrupt environment as a leading factor to more firm-led renegotiations. Moreover, the evidence available from the literature indicates that inappropriate design, opportunistic bidding, renegotiations, are responsible for the poor PPP infrastructure projects implementation with resultant effects of contract delay, road projects abandonment and non-achievement of VfM (Engel et al., 2014a; Gifford et al., 2014; Guasch et al., 2014; Sarmento, 2014; Cruz and Marques, 2013).

The background and circumstances in the PPP project environment necessitated research into PPP renegotiation, especially regarding the emerging issues surrounding renegotiation of PPP road projects. Critical evaluation of PPP road projects renegotiation reveals that satisfactory outcomes are elusive to the stakeholders, mainly in the delivery of VfM for the public-sector client (Guasch et al., 2014; Sarmento 2014; Acerete et al., 2010; Baeza & Vassallo, 2010; Estache et al., 2009). Though non-achievement of VfM is established in the literature regarding PPP renegotiations, little is, however, known in the context of the UK and some European Union countries (Makovsek et al., 2015). The little renegotiation knowledge is surprising, especially in the UK in consideration of the high adoption of PPP in the form of PFI for infrastructure projects delivery including roads (Akintoye, 2009; Carrillo et al., 2008; Debande, 2002). Hence, it is justifiable to research UK PFI renegotiations in the road sector to address the gap in PPP renegotiation knowledge, especially in the road sector.

Corroboratively, experiences of other European countries like Spain and Portugal as revealed by the findings of the literature indicate that renegotiation has constituted one of the significant myriads of problems affecting the successful implementation of PPP road projects particularly regarding VfM (Sarmento, 2014; Baeza and Vassallo, 2010). Acerete et al. (2010, p. 58-59) agree with these pieces of literature by stating as follows, *"the use of private finance for roads can be viewed as a classic example of privatising the benefits and nationalising the costs."* Therefore, the main problem of PPP road projects renegotiations is that VfM has not been delivered to the respective stakeholders especially the public sector (Cruz et al., 2015; Guasch et al., 2014; Sarmento, 2014). Hence, the statement of the problem is as follows: *how can VfM considerations*

be integrated into the appropriate phases of PPP road projects in consideration of the high incidences of renegotiations? Satisfactory resolution of this problem will ensure successful renegotiation, which addresses the value for money question in PPP road projects renegotiation.

1.3 RESEARCH QUESTIONS

To resolve the research problem in the context of the UK, the research propositions are:

Research Question 1: Are there incidences of renegotiations in UK PFI (DBFO) road projects?

Research Question 2: What are the factors leading to the renegotiation of PFI (DBFO) road projects in the UK?

Research Question 3: Does the renegotiation of UK PFI (DBFO) road projects impact VfM criteria?

Research Question 4: What are the outcomes of the renegotiation of PFI (DBFO) road projects in the UK?

Research Question 5: What are the measures to ensure the achievement of VfM in PFI (DBFO) road projects renegotiation in the UK?

1.4 RESEARCH AIM AND OBJECTIVES

The research aims to integrate value for money into the renegotiation of PFI (DBFO) road projects. The objectives are:

Objective 1: To review PPP as a procurement method for the delivery of public sector infrastructures including road projects.

Objective 2: To evaluate renegotiation and VfM criteria in PPP environment, particularly in road projects.

Objective 3: To investigate PFI (DBFO) road projects to identify incidences and factors leading to renegotiation.

Objective 4: To ascertain the impacts of the renegotiation of PFI (DBFO) road projects on VfM criteria.

Objective 5: To evaluate and assess the outcomes of the renegotiation of PFI (DBFO) road projects.

Objective 6: To develop and validate a VfM renegotiation framework for DBFO road projects.

1.5 RESEARCH PROGRAMME FLOW

The research program flow identifies the methods of gathering data, techniques of data analysis, research findings and relationships among the research objectives as shown in Figure 1.1.

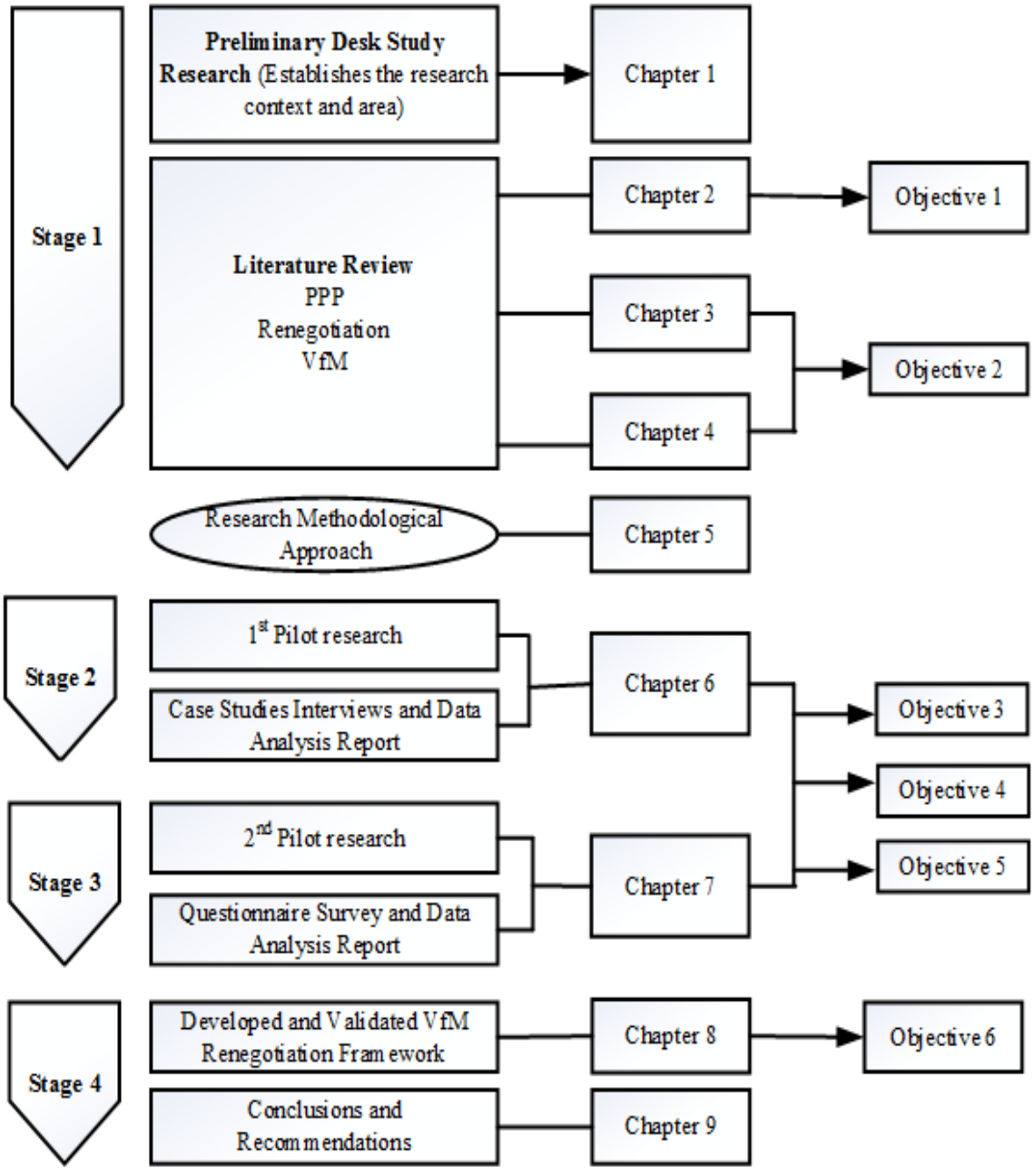


Figure 1.1: Research Framework and Processes

1.6 SCOPE OF THE RESEARCH

The water and transport sectors are prone to renegotiation in Latin America countries, which have records of high adoption of PPP for infrastructure projects delivery (Guasch et al., 2014; Estache et al., 2009). In the transportation sector, however, there is the evidence of higher percentage of renegotiations in road projects in comparison to other infrastructure projects of the transport sector (Guasch et al., 2008b). Similarly, road projects have a high degree of PPP adoption across the world with substantial financial investment (PPI Database, 2016). Hence, this research focuses on PPP road projects based on the record of high percentages of renegotiations leading to non-achievement of VfM for the procuring authorities across numerous countries (Guasch, 2014; Sarmento, 2014; Acerete et al., 2010; Baeza and Vassallo, 2010). In the UK, there is a long history of DBFO adoption for the massive finance of PFI road projects (Debande, 2002). Other literatures corroborate this submission that DBFO is the method adopted for the provision of road projects in the UK (Akbiyikli, 2011; Debande, 2002). Thus, PFI is a model of PPP introduced by the UK government for infrastructure projects procurement to improve the level of public services including road projects (Carrillo et al., 2006). The high adoption of DBFO for road projects delivery in comparison to other modes of transport sector projects improves the feasibility and viability of conducting an independent study in the UK road sector.

The several renegotiation incidences, outcomes and the beneficiary of the renegotiation process have been established for Latin America countries like Brazil, Chile, Colombia, and Peru (Guasch et al. 2014; Estache et al. 2009). Portugal, Spain, and Greece have also been indicated as having incidences of renegotiation (Sarmento, 2014; Moore et al. 2014; Nikolaidis and Roumbotsos, 2013; Acerete et al. 2010; Guasch and Straub, 2009; Guasch et al., 2008). Also, the literature attests to the occurrence of renegotiation in varying degrees in other countries like Portugal, Spain, Greece and the USA (Gifford et al., 2014; Sarmento and Renneboog 2014; Nikolaidis and Roumbotsos, 2013; Acerete et al., 2010). However, the UK is characterised by few theoretical and empirical literature on PPP renegotiations especially in the road sector (Makovsek et al., 2015; Hasselgren et al., 2014). The few literature findings regarding renegotiation of PFI (DBFO) road projects in the UK further justify the need for renegotiation study. Hence, this study engages the UK public agency and concessionaires involved in PFI (DBFO) road projects, which is the procurement arrangement used for transport projects, especially roads in Spain and the UK (Acerete et al., 2010; Shaoul et al., 2006; Debande, 2002).

The investigation of PFI (DBFO) road projects is proposed for the pre-construction, construction and operation and maintenance phases, particularly after the signing of the contract and before the completion and handing over by the concessionaire. The basis for the choice of these

implementation stages are premised on the literature, which identifies the occurrence of renegotiation of PPP projects shortly after the financial close and through construction to completion and handing over of the project to the procuring authority (Sarmento, 2014). Yuan et al. (2009, p.256) further establish as follows, *"PPPs studies are centered on broad social and organisation levels and provides few insights into the management of inter-organisational relationships and process control."* These agree with the findings of previous literature that there is the need for proper management and monitoring of the renegotiation process at the identified phases to address renegotiation issues in PPP infrastructure projects delivery (Guasch et al., 2014; Sarmento, 2014; Acerete et al., 2010).

Also, the findings of literature reveal that much work needs to be done to identify ways of tackling the factors affecting quality, transaction cost and delivery time of PPP transport projects at the contract stage (Acerete et al., 2010; Acerete et al. 2009; Guasch et al., 2008). Hence, the need to critically look at the process of PPP arrangement at the construction and operation stages to develop a framework that incorporates necessary measures and mechanisms to check revenue leakage, cost and time overruns, which are all attributed to renegotiation of PPP road projects. The gap in PPP renegotiation literature of the UK and other PPP practicing countries makes it expedient to assess PPP road projects renegotiation experience of the UK in comparison with the experiences of other nations (Makovsek et al., 2015; Sarmento, 2014; Engel et al., 2014a; Acerete et al., 2010). Moreover, the research of the UK PFI (DBFO) road projects is justified based on the need to provide an original and pioneer contribution to renegotiation knowledge to address the current problem of VfM attributable to PPP road projects renegotiation of other PPP practising countries.

1.7 CONTRIBUTION TO KNOWLEDGE AND ORIGINALITY

The research furthers the understanding of the subject of renegotiation of road projects with reference to VfM. Information regarding how VfM is achieved at the renegotiation of PFI road projects in the UK is one of the products of this research. The study further makes available results about the experiences of renegotiation and changes on the sampled case studies, and the wider UK PFI population covered quantitatively. The VfM renegotiation framework incorporates the main findings of the empirical objectives.

Previous studies have succeeded in identifying renegotiation incidences in PPP infrastructure projects such as transport, water, power, and electricity. These studies give the respective percentages of PPP infrastructure projects renegotiation on a sectoral basis in Latin American countries (Guasch et al., 2014; Guasch and Straub, 2009a; Guasch et al., 2008b). These studies have succeeded in providing the renegotiation statistics of some countries in Europe like Portugal

and Greece (Sarmento and Renneboog, 2014; Nikolaidis et al., 2013). In the UK, however, there is a differing experience of PPP renegotiation, which informs the need for current research and possible research in the future. Hence, the reason for the conduction of this study, which provides empirical quantitative and qualitative data through the analysis of the findings of each of the objectives of this study in the context of UK PFI (DBFO) road projects.

Most infrastructure projects including PPP have assessed success parameters such as costs, time, quality and user's satisfaction. This research intends to identify the measurable variables and criteria of VfM towards establishing their relationship with the renegotiation of PFI road projects. These, therefore, addresses the several considerations required towards the integration of VfM into the renegotiation process of PFI (DBFO) road projects. This contribution is significant as it establishes effective and efficient solutions for the renegotiation of PPP road concessions towards achieving VfM objectives for the respective stakeholders, especially the client's objectives.

The VfM renegotiation framework developed and validated is the main contribution to knowledge, which if appropriately and proactively adopted will guide renegotiation between the private and public stakeholders towards the achievement of VfM. Efficient use of the framework will assist the renegotiation of PPP road projects to ensure the VfM success for the stakeholders especially the public sector. The practical application of the VfM renegotiation framework will proactively reduce and possibly eliminate lengthy renegotiation leading to cost and time overruns, which all constitute adverse renegotiation outcomes and results (Sarmento 2014; Acerete et al.; 2009). Conclusively, the public agencies and concessionaire are now able to choose appropriate remedial actions and measures, which will pave the way for the development of sustainable renegotiation strategies that ensures VfM achievement. The need for the choice of a proper rule, mechanism and remedial actions where necessary are among the unique contribution of this study and constitute significant considerations in a PPP project road environment to ensure the achievement of client's VfM objectives, users' satisfaction and private investor's interest and motives.

1.8 STRUCTURE OF THE THESIS

This thesis contains nine chapters. The summary of the content of each chapter is as follows:

Chapter 1 gives a comprehensive research introduction covering the vast areas of PPP and the inherent issues and problems leading to the research questions, aim, and objectives.

Chapter 2 explains PPP adoption for general infrastructure projects delivery. Reference was made regarding the use of PPP for the procurement of transport sector projects and establishes a research gap in the field of renegotiation (especially in road projects). Also, the chapter describes

the types and classes of PPP road projects in the UK. There are appraisals of PFI (DBFO) road projects in the UK, which establishes their characteristics, stakeholders and their respective partners and structures.

Chapter 3 discusses the concepts, objectives, classifications, and types of contract renegotiation. There are discussions regarding renegotiations in PPP, impacts and outcomes of the renegotiations, and factors leading to renegotiations. Measures to ensure the achievement of VfM at the renegotiations of PPP projects are enumerated and discussed.

Chapter 4 evaluates the concept of value for money in PPP projects in general and establishes the criteria for measuring VfM in infrastructure projects concerning the transport sector projects.

Chapter 5 outlines and describes the methodology adopted, and the criteria for the choice of the appropriate methodology for the research.

Chapter 6 only presents and explains the analysed data and discusses the results of the qualitative case study interviews, which further confirms, contrasts and compares key issues from the literature perspectives. In addition, the chapter establishes the factors leading to renegotiation, the outcomes of the renegotiation, and the impacts of PFI (DBFO) road projects renegotiation on the several VfM criteria. There is the identification of measures adopted in the respective case studies to ensure the achievement of VfM at renegotiation.

Chapter 7 further discusses the findings of the questionnaire survey based on the findings of the literature and case studies to tackle the research objectives 3, 4 and 5.

Chapter 8 discusses the processes of the development and validation of the VfM renegotiation framework for ensuring the achievement of VfM at renegotiation. There is a full discussion on the importance and significance of integrating considerations of VfM into the renegotiations of PPP road projects. The chapter further establishes a range of sustainable measures required from the design stage through completion to guide successful renegotiation for stakeholders (especially the public sector). This chapter addresses Objective 6 of the research.

Chapter 9 is the final chapter of this thesis, which gives the key research findings based on the objectives identified in chapter 1. The chapter further presents the general conclusion and clearly mention the contribution to knowledge (both theory and practice). Chapter 9 provides recommendations based on research findings and suggestions were enumerated regarding areas requiring further investigations.

CHAPTER 2 AN OVERVIEW OF PUBLIC PRIVATE PARTNERSHIP PROJECTS

2.1 INTRODUCTION

This chapter discusses PPP as a procurement method for infrastructure projects delivery, especially road projects, and explains the procurement concept regarding the definitions, models and the fundamental objectives of the stakeholders as identified in Objective 1 of Chapter 1 of this research study. The chapter justifies the need and importance of PPP for infrastructure projects delivery, including roads. The discussion of the concept of PPP in this chapter furthers the understanding and appreciation of its adoption and application in the delivery of infrastructure projects, especially road projects. There is the presentation of the types and classification of road projects in the UK from the evaluation of their respective characteristics and categories. The chapter further expands and compares the available models of PPP in the UK, especially in road projects delivery. The individual partnership structures used in both tolled and other road projects delivery including the roles and contact details of the PFI stakeholders in the UK (i.e., the procuring authority, SPV or concessionaire and the equity companies or financial lenders) are discussed.

The chapter concludes by summarising PPP in general infrastructure project delivery with reference to road projects and its inherent implementation challenges, which form the premise for the following section of the thesis.

2.2 THE CONCEPT OF PUBLIC PRIVATE PARTNERSHIP

Procurement means obtaining work, services or products, which could be implemented through various systems or methods (Love et al., 2008; Gruneberg and Hughes, 2004). There are various types of procurement methods available for delivering infrastructure projects in the UK and other parts of the world. Some of these procurement methods are: construction management, design and build, design and construct, a framework agreement, lane rental-competitive tender, management, measured term, partnering contract, schedule of rates, traditional, turnkey and lump sum (Davis et al., 2008). Lump sum has variants, which include firm bills of quantities (BQ), specifications and drawings, re-measurement – approximate, prime cost and fixed fee (Davis et al., 2008). However, most projects were traditionally procured in the UK and other parts of the

EU until the early 1990s before PPP emerged (Akintoye et al., 2003). Therefore, it can be noted that among all these early procurement methods, the traditional method was more used for the delivery of infrastructure projects before the emergence of PPP, across the world and particularly in the UK (Akintoye, 2009).

Most infrastructure projects have been procured through the traditional method by the public-sector clients because of the familiarity inherent in its use and the willingness to adopt in-house expertise in the delivery of such projects. However, because of the shortcomings observed in the adoption of the traditional procurement method for infrastructure projects delivery, which includes and it is not limited to cost and time overruns, there seems to be a shift by national governments to PPP's (Li et al., 2005; Alhazmi and McCaffer, 2000). According to Pollock et al., (2007 p. 127) the shortcomings of the traditional procurement method and other methods of procurement are stated as follows, *"PFI projects are on time and budget. HM Treasury research into completed PFI projects showed 88% coming in on time, early, and with no cost overruns on construction borne by the public sector".* Previous research has, however, shown that 70% of non-PFI projects were late and 73% ran over budget (Pollock et al., 2007).

There are numerous reasons for these shifts to PPP for the procurement of infrastructure projects. The need to address the infrastructure gap because of budgetary constraints and the advantage of adopting the private sector's higher level of efficiency and management are the primary reasons why PPP are taken for infrastructure projects procurement (Grimsey and Lewis, 2005). Other studies identify the need or demand of the population for public services, the government's decision to achieve the projects or services within the purview of the private sector's higher level of efficiency, among others (Yehoue et al., 2006). Thus, PPP are adopted by governments based on the identified reasons to address the constraints with respects to funding, high demand, workforce technicalities and complexities of PPP projects.

The challenge of limited financial resources for development of infrastructure projects has brought several degrees of discussion in both theory and practice on how to procure infrastructure projects effectively and efficiently. Governments all over the world have continued to devise ways from the traditional form of procurement to the Public Private Partnership (PPP) to address the increasing needs of the population for public infrastructure services (Hammami et al., 2006; Cherry, 2005). Thus, attention has been drawn to PPPs for the delivery of infrastructure projects because of the advantages it offers through the bridging of infrastructure gap occasioned by budgetary constraints and the opportunity of adopting the private sector higher level of efficiency and management (Sarmento, 2014; Pollock et al., 2007; Grimsey and Lewis 2005). These main advantages make PPP preferred by governments of countries over the traditional procurement method and other methods of infrastructure procurement.

Li and Akintoye (2003) state the benefits of PPP to include the enhancement of government's capacity to develop integrated solutions, creative and innovative approaches, reduction in the cost and time to implement the project, risks transfer to the private sector, attraction of sophisticated bidders, access to advanced skills, and experience and level of technological competence of the concessionaire. These benefits of PPP constitute reasons for the adoption of the procurement method and seem to corroborate the view of Sarmento (2014), which concludes that PPP provides value for money (VfM) through efficient risk transfer, innovation, higher asset utilisation and integrated whole life management. Corroboratively, the advantages of PPP include sound quality management, experience, technology, skills, innovation and a reduction in construction and operational costs deviations, which are considered critical variables in the measurement of the value of a project (Tsamboulas et al., 2013; Cheung & Chan, 2012).

Defining PPP in detail seems difficult considering its uses and application by several authors in the literature, and various policy or government documents (Xiong and Zhang, 2014; Carmona, 2010; Akintoye et al., 2003). It is, therefore, necessary to assess selected definitions of PPP to foster a better understanding of the subject, and to provide a basis for the emerging issues. Grimsey and Lewis (2005) and Carmona (2010) describe PPP as the filler of the space created through the adoption of the traditional method of procurement and the use of private finance for infrastructure projects delivery. Koppenjan (2005) describes PPP as the planning, construction, and operation of infrastructural facilities through the allocation and sharing of risks, costs, benefits, resources, and responsibilities in a structured and cooperative form between the public client, and the concessionaire. These definitions show that PPP adoption spans processes and bridges the gap inherent in traditional procurement methods.

Akintoye (2009 p. 124) states as follows, *"PPPs can best be understood as a contractual agreement of shared ownership between a public agency and a private company, which involves the pooling together of resources and sharing of project risks and rewards, to create efficiency in the production and provision of public or private goods".* There is a clear agreement between this definition and other descriptions of PPP, which posit that the method involves collaborating and sharing of risks, responsibilities, resources and benefits (Sarmento, 2014). It differs significantly from the traditional procurement method where the public authority takes full responsibility and only relinquishes the residual obligations (Cartlidge, 2006). Private Finance Initiative (PFI), which is a variant of PPP has also been recognised as a long-term procurement method that spans years usually 25 to 30 years and across inception, initiation, planning, controlling, operation and maintenance stages (Mustapha and Carrillo, 2008). The long-term nature of PPP makes its implementation demanding and difficult. Hence, the need for proper measures and actions that will facilitate the achievement of stakeholder's objectives, especially public client objectives.

HM Treasury (2014) corroborates these definitions by identifying PPP as an arrangement between two or more entities, i.e., client, concessionaire or other stakeholders such as lenders, which encourages cooperative work that fosters the sharing of authority and responsibility, resources investment; through collaboration, shared risk-taking and mutual benefits. Xiong and Zhang (2014) indicate that PPP is a contractual agreement that brings a public agency and a private company to form a consortium of financial institutions, construction companies, and operation and maintenance companies to finance, build and operate a project belonging to the public client and to provide the corresponding service and generate revenues.

The consideration in the provision of these services is on the condition that VfM will be the ultimate benefit to the government, users, and taxpayers (Akbiyikli et al., 2011). However, these definitions are subjective, as they do not seem appropriate or applicable in all cases except in a given situation of a procurement arrangement (Carmona, 2010). These suggest that the respective infrastructure projects may be suitable for a given system of procurements. As such, the definitions of PPP may be more appropriate for a specific instance of infrastructure project. It is, therefore, necessary to adopt some of them to unravel the meaning of PPP as it borders on the respective objectives, roles and the ensuing benefits coupled with expectations of all stakeholders concerning PPP implementation. It is also pertinent to select these definitions to provide a sound understanding, which gives a broad and all-encompassing view and appreciation of the direction of the discussion in the succeeding sections of this thesis.

The definitions indicate that PPP requires a collaborative working between the client and the private concessionaire (Cheung, 2009; Kwak et al., 2009). Kwak et al., (2009 p. 52) state that PPP is *"a cooperative arrangement between the public and private sectors that involves the sharing of resources, risks, responsibilities, and rewards with others for the achievement of joint objectives."* The collaborative working for the provision of public goods and services is the responsibility of two key stakeholders (public and private sector or consortium) involved in the partnership. These two parties to the PPP agreement are to cooperate to ensure that services provided at every stage of the procurement process are of high standard, delivered within budget, and stipulated time. This cooperation is mainly to ensure that the defined objectives, which are value for money (VfM) for the public-sector client, profitable return on the private sector company investment and affordability of cost of the service to the users (Sarmento, 2014).

The public client and the private sector partner usually agree to the sharing of the risks, responsibility, and rewards for the mutual benefits and to satisfy the interest of the users, and taxpayers (Sarmento, 2014). The three cogent elements are resource, risk, and benefits (RRB). The benefits could be VfM. The funds of both partners serve as resource or project investment, which is a response to the limited power of governments or public agencies to provide such

resources individually. This joint contribution of the funds creates room for the inherent risks to be shared between both partners leading to mutual benefits to the parties for the utility and enjoyment of users or taxpayers. These benefits could be in the form of profits to the concessionaire, and VfM to the public client, and satisfaction to the members of the public or end users (Sarmento, 2014; Debande, 2002).

PPP is, therefore, a method of work that solely relies on the cooperative relationship between both public and private partners for the provision of social infrastructure services that ensures VfM for the public client, affordability and satisfaction to the user and profitability to the private concessionaire for the investment. However, efficient and effective sharing of skills, responsibility, resources, and risks (SRRR) is essential and required (Sarmento, 2014; Kwak et al., 2009). The principle of authority, responsibility, finance, risks and benefits sharing, according to Akintoye (2009), is to foster efficient production and provision of the services, which is one of the core prerequisites of the partnership.

The continued adoption of PPP for infrastructure projects provision suggests that VfM is achieved for the procuring authorities. Though, there have been naggings and questions surrounding its full achievement during the implementation of PPP projects. Value for money (VfM), which is the principal objectives of the public client has been defined as the optimum achievement of the three E's, i.e., economy, efficiency, and effectiveness in PPP infrastructure road projects (Muvirimi, 2012; Henjewele et al., 2011). The deduction from the submission of these literature suggests that the client can only be satisfied with the PPP projects in a situation where the SPV achieve low cost for more significant and quality outputs at first attempts to the satisfaction of the users or members of the public. Hence, Value for money (VfM) implies achieving good and satisfactory product, service costs and quality (fitness for purpose) within the whole life of the contract (contract duration) to meet the requirements of members of the public or users of the infrastructure facility (road inclusive). Therefore, PPP project can be regarded as successful only in a situation where it delivers the project to the users at the budgeted cost, within the specified duration and quality amongst other criteria that may be defined and agreed by the primary stakeholders at the inception of the contract.

The literature identifies four stakeholders' as the beneficiaries in a given PPP project as follows: the public sector or government agency, the private sector or consortium, employees, and users or members of the public (Cheung, 2009). However, the financial lender or borrower are regarded as a stakeholder that gain interest through funds provided to the private sector partner (Gatti, 2014). As a result, the lenders of financial resources are also regarded as a beneficiary in a PPP infrastructure project. Though, the provision of PPP infrastructures in the construction industry, for example, is the responsibility of two key stakeholders (public and private sector or consortium)

involved in the implementation of the partnership objectives (Bing et al., 2005). These two parties are expected to cooperate to ensure that services provided are of high standard or quality, delivered within budget and stipulated time. The cooperation is mainly to ensure that the stakeholders' objectives, which are VfM for the public client, profit for the private sector company investment and affordability of cost of the service to the users, are achieved (Kwak et al., 2009; Mackintosh, 1992). It is, therefore, imperative based on the existing PPP literature to posit that PPP transactions should keep in view the respective objectives of stakeholders defined at the inception of the contract throughout the stages of implementation of infrastructure projects.

2.3 MODELS OF PUBLIC PRIVATE PARTNERSHIP AND CONTRACT TYPES

Evenhuis and Vickerman (2010) identify various types of contracts in PPP transport sector as Build-Operate-Transfer (BOT), Build-Own-Operate (BOO), Design-Build-Finance-Maintain-Operate (DBFMO) and concessions, also called Design-Build-Finance-Operate (DBFO). A cross-examination of PPP models such as PFI reveals that each of the contract types is adopted across the models of PPP for the delivery of infrastructure construction projects, ranging from small to large construction projects across various countries (Strong and Chhun, 2014; Rebeiz, 2011). Other studies also support the submission of these authors that the models of PPP are diverse. HM Treasury (2014), for instance, provides eight models of PPP usually adopted for the delivery of infrastructure projects in the UK. PFI is significantly approved by the UK procuring authorities in the delivery of infrastructure projects including roads (Akintoye, 2009).

Various PPP models discussed here are broadly classified into three categories according to the stage of the project, ownership of the facility and method of repayment respectively (Gil, 2013; Grimsey and Lewis, 2007b).

2.3.1 Classification of PPP Models According to Stage of Project

In this class of PPP, the respective responsibilities of the private sector partner are diversified and encapsulated within the model. This classification also reflects the tasks to be performed within the model and the definition of the sequence of each of the operation or work. The models of PPP are numerous and are classified based on circumstances and peculiarities of each country (Eaton et al., 2007). The Design-Build-Finance-Operate (DBFO) is an essential PFI variant usually regarded as a concession contract, and used, especially for road projects (Debande, 2002). In this model, the concessionaires agree with the client and undertake to execute the infrastructure facility contract by DBFO using the fund at its disposal within the agreed contract period, usually 25 to 30 years in most cases (Mustapha and Carrillo, 2008). Also, it is adopted for the PPP/PFI roads mainly within the UK and Spain respectively (Graham et al, 2012; Acerete et al., 2010).

Other models available include but not limited to Design-Build-Finance-Maintain (DBFM) involving the design, build, and finance of a project by a private entity including the responsibility of executing all maintenance works as part of the contractual obligations before transferring it to the public body. However, the Design-Build-Operate-Maintain (DBOM) involves the collective responsibility of the partners in the designing, building, operating and maintaining the infrastructure projects. However, before the transfer, the private sector partner is expected to meet the agreed performance standards defined at the time of forming the contract concerning the physical condition and capacity of the facility including operating quality of the facility (Koppenjan and Enserink, 2009; Siemiatycki, 2009).

The Design- Construct- Manage- Finance (DCMF) model is similar in scope to the DBFO and DBOM. There is an appreciation of the applicability of the model for prison projects. The private entity provides most of the services under this procurement model with the execution of the residual duties by the public-sector partner (Graham et al., 2012). On the other hand, Design-Build-Operate (DBO) model involves both the private and the public partners. The private sector builds and operates a facility on behalf of the public-sector partner, who owns and finances the construction of the new facility with the payment of construction cost and operating fee (Gil, 2013). Also, Design-Build (DB) arrangement is one that allows the private party to take responsibility for the design and build of the project to the satisfaction of the public-sector partner through the transfer of cost overrun risk to the private sector representative. On concluding the contractual responsibilities by the private party, the public entity assumes full responsibility for the operation of the facility. This same situation also persists in the case of Design-Build-Maintain (DBM). However, a long-term maintenance arrangement necessitates that the public sector retains the ownership and operation of the infrastructure.

2.3.2 Classification of PPP Models According to Ownership of Facility

Gil (2013) and Amade (2012) classify PPP models into various variants to include the following: Buy-Build-Operate (BBO), Operation License (OL), Finance Only (FO), Build Operate Transfer (BOT), Build-Transfer-Operate (BTO), Build-Rehabilitate-Operate-Transfer (BROT), Build-Own-Operate-Transfer (BOOT) and Rehabilitate-Own-Operate-Transfer (ROOT). Build–Own-Operate–Transfer (BOOT) is a type of PPP contract where the private firm introduces a service charge throughout the implementation stage of a concession contract before the handing over of the facility to the government (Allard and Trabant, 2011; Arndt, 2000). Arndt (2000) state that governments adopt this type of contract in PPP projects to bundle the design and construction, finance, operations, and maintenance. PPP contract, therefore, encompasses the stage of design, construction, finance, operations and maintenance, which could constitute the criteria for the formation of the contract type. However, a Build Lease (BL) is also called Own Operate (OO) is

a PPP procurement method, which ensures that the private organisation acquires the land required for the development and operation of the facility on behalf of the government (Ki-ian, 2002).

In Design-Build (DB), the private partner in this type of arrangement ensures that the design and building of the facility are based on the objective of the public partner, and there is usually the delivery of the service as agreed in the contract. However, the risk of cost overruns is taken by the private company (Rosner et al., 2009). This literature attests that there is outperformance of the Design-Bid-Build (DBB) by this method. Design-Build-Maintain-(DBM) arrangement require the private sector firm to take on the design, construction and maintenance responsibility of the facility. This kind of contract is a long-term maintenance arrangement where it is within the purview of the public partner to retain the ownership and operation of the infrastructure facility (Hall et al., 2003).

Furthermore, Operations and Maintenance contracts (O & M) require the private party to be solely responsible for the execution of the operation and management of a public infrastructure including any other responsibility that may be jointly agreed at the inception of the contract (Biau et al., 2008). Conclusively, concessions contract also regarded as DBFO represent a PPP type where exclusive responsibility is given to the private partner for the design, build, finance and operate the infrastructure project (Delmon, 2010). The procuring authority retains the perpetual right of ownership while the private concessionaire retains the right to own the facility throughout the concession period on the understanding that the service is to be transferred to the procuring authority at the end of the concession period as agreed in the contract. Most PFI road projects are on the DBFO basis (Akbiyikli et al., 2006; Debande, 2002). The first eight DBFO roads in the UK are an excellent example of this type of PPP contract in the model of PFI (Shaoul et al., 2006).

In joint ventures, both the public and private entities jointly finance the infrastructure projects. Also, they own and carry out the operation of the facility collaboratively at the same time as stipulated in the contract (Amade, 2012). There can be the implementation of all these types of contract based on ownership given the objectives and requirements of the main parties to the PPP agreement especially the public entity (Kwak et al., 2009). Thus, PPP infrastructure projects could take any of the contract types enumerated herein depending on the client's objectives and requirements.

2.3.3 Classification of PPP Models According to Method of Repayment

PPP models can also be classified according to repayment method. One of the classifications of PPP models identified by Song (2005) is the repayment method. This type of repayment as substantiated by Gil (2013) as a financially freestanding project and service sold to the public sector by way of reimbursement. The former entails refund of the costs of PPP via tariff from end

users while the latter involves the payment of a fee from the procurement authority (Gil 2013; Allen, 2003). Therefore, in the free-standing projects (tariff base), the private sector ensures that tariffs are collected from the users of services provided. However, it is the sole responsibility of the government to ensure that social benefits are embedded in the services of the PPP supplied by the private sector, which may include enhancement of road quality and ensuring road decongestion (Partnerships UK, 2011).

The relevant PPP models, which are tariff base include but not limited to Build-Operate and Transfer (BOT), Rehabilitate- Operate-Transfer (ROT), Build-Own-Operate-Transfer (BOOT), Build-Own-Operate (BOO), etc. (Zatar, 2014). The models under this classification include the following, depending on the circumstances and peculiarities of each country. The Design-Build-Finance-Operate (DBFO) is one of the most important models usually adopted for concession contracts, particularly road projects (Akbıyıklı, 2013). The model affords the private sector partner the opportunity of undertaking to execute the design, build and operation of the infrastructure facility using the finance at its disposal within the agreed contract period, usually 25 to 30 years (Acerete et al., 2010). This model is predominantly used in the UK and Spain road sectors respectively (Akbiyikli, 2013; Acerete et al., 2010). The private party provides the fund required for the project including the financing of the debt. The responsibility also includes the operation of the facility throughout the concession period.

The Design-Construct-Manage-Finance (DCMF) model is similar in scope to the DBFO and DBOM. It is, however, mostly adopted for prison projects. The private entity provides most of the services under this procurement model with the extra duties executed by the public-sector partner. A Design-Build (DB) arrangement ensures that the design and build responsibility is carried out by the private partner based on the need and objective of the public partner at a fee specified in the contract. On concluding the contractual responsibilities by the private party, the public entity assumes full responsibility for the operation. Other models adopted for infrastructure projects procurement are Buy-Build-Operate (BBO), Operation Licence (OL), Finance Only (FO), Build-Operate-Transfer (BOT), Build-Transfer-Operate (BTO), Build-Rehabilitate-Operate-Transfer (BROT), Build-Own-Operate-Transfer (BOOT), Rehabilitate-Own-Operate-Transfer (ROOT), Build–Own-Operate–Transfer (BOOT), Build Lease or Own Operate (BL), Design-Build (DB) Design-Build-Maintain(DBM), Operations and Maintenance Contracts (O and M) and Build-Own-Operate (BOO) (Zatar, 2014).

Therefore, in the free-standing, projects (tariff base), the private sector ensures that tariffs are collected from the users of services provided. However, the government usually ensures that social benefits are embedded in the services of the PPP provided by the private sector, which may include enhancement of road quality and reducing road congestion (Eadie et al., 2013). Suitable

examples of infrastructure projects executed on a tariff basis include the Queen Elizabeth II (Dartford) Bridge in the UK and the Incheon Airport Expressway in Korea (Gil, 2013).

The public sector may make a fee available for the private sector services of providing infrastructure services for members of the public. This strategy is termed services sold to the public sector (via a fee-based approach), which may involve the construction of highways by the private sector through the DBFO approach over an agreed period, e.g., 30 years. Design-Build-Finance-Operate (DBFO), Build-Transfer-Lease (BTL) and Build-Lease-Transfer (BLT) are good examples of PPP models classified as services sold to the public sector on a fee-based repayment type (Allen, 2003). The case of the M1-A1 motorway, which connects the UK, and the Daegok-Sosa Railway in Korea serve as good examples of projects executed by the public client through a repayment plan.

2.4 PUBLIC PRIVATE PARTNERSHIP IN INFRASTRUCTURE PROJECT DELIVERY

There are diverse sectors in any nation's economy having distinct characteristics, natures, and peculiarities. These segments include transport, water, financial, agricultural, educational, telecommunications amongst others. In each of these sectors, PPP has been used for close to three decades across the world, notably the UK, since the beginning of 1990 (Akintoye, 2009; Akintoye and Chinyio, 2005). Strong and Chhun (2014) identify the various categories of PPP adopted in infrastructure projects delivery in developing countries based on the extent of involvement, the level of risks and responsibilities of the private sector. The four categories identified include concession (e.g., BOT, BOOT, etc.), divestiture or full private participation (e.g., BOO), management contract, greenfield projects and divestiture (e.g., BOO).

Other notable literature has also established the various types of PPP that are used for the general delivery of infrastructure construction projects, ranging from small to large projects (Akbiyikli et al., 2011). The respective projects by type and their region of the world are shown in Table 2.1.

Table 2.1: Number of Projects by Region and Partnership Type

Region	Concession	Divestiture	Greenfield project	Management & lease contract	Total
East Asia and Pacific	124	42	208	9	383
Europe and Central Asia	29	19	18	10	76
Latin America and the Caribbean	378	8	145	35	566
Middle East and North Africa	14	0	13	8	35
South Asia	345	0	98	7	450
Sub-Saharan Africa	63	3	20	16	102
Total	**953**	**72**	**502**	**85**	**1612**

Source: World Bank PPI Database (2015)

These different type of projects as outlined in Table 2.1 are discussed in the succeeding sections of this thesis.

2.4.1 Concessions

The concession could be for a new infrastructure project or an existing infrastructure. Carmona (2010) divides concessions into Greenfield and Brownfield concessions. Greenfield concessions are concessions where the private sector agrees to build and operate a new facility for the period specified in a contract, while a Brownfield concession is an arrangement where the private agent takes over the management of a state-owned (existing) undertaking for a given period. However, there is a significant assumption of investment risks by the private sector. In Greenfield projects, the private investor does not assume significant or significant risks within the time specified within the contracts. The infrastructure returns to public sector control at the end of the concession period. These models include Build-Lease-Own (BLO); Build-Own-Transfer (BOT), Build-Own-Operate-Transfer (BOOT); Build-Own-Operate (BOO) and Merchant Projects. Most infrastructure projects are Greenfield projects while the opposite of Greenfield is Brownfield.

2.4.2 Divestitures or Full Private Participation

Divestitures also called full private participation is a method of partnership where the private sector entirely takes overall responsibility for the design, construction, finance, operation, and maintenance of the infrastructure project and bears all significant risks involved in the delivery of the infrastructural facility (Harris, 2003). The management of the infrastructure facility is vested in the private investor as described in the agreement and terms of reference signed by the parties. The government only bears residual obligations and responsibility under this type of PPP.

2.4.3 Management Contract

The management contractor manages the facility on behalf and with the consent of the government and retains the burden of operating the emerging risk (Singh and Kalidindi, 2006). The lease contract involves the management of an infrastructure project by a private company through the payment of a fee to the procuring authority (Nikolic and Maikisch, 2006). There is also the sharing of most of the risk during the operation of the infrastructure facility. Summarily, the information provided in Table 2.1 indicates that most infrastructure projects, including transport projects, are on a concession basis across all regions.

2.5 PUBLIC PRIVATE PARTNERSHIP PROJECTS IN THE TRANSPORT SECTOR

PPP has been widely adopted in the delivery of infrastructure projects (Nikolaidis et al., 2013). Among all infrastructure sectors, the transport sector has extensive records of PPP adoption especially in road projects (PPI Database, 2016). Table 2.2 gives credence to this submission. The reason for this may be based on the characteristics and features of the transport sector and the need for the movement of persons and goods from one place to another daily. This reason makes the infrastructure projects of this industry distinct when compared to other sectors. Markard (2009) corroborates the uniqueness and characteristics of the transport sector to include the provision of services of general interest or fundamental importance. The transport sectors have also been known to have different types of physical networks, the capital intensity of transport facilities or asset and product durability. It also features the involvement of public organisations in its delivery, the magnitude of regulation, systemic characteristics and resistance to change and the impacts of transport sector activities on the environment (Markard, 2009).

The transport sector is the most intensive sectors in any nation's industry as it accounts for the highest financial investment in most countries (Akintoye, 2009). The reason for this may be based on the importance of the transport sector projects to the activities of other infrastructure sectors, e.g., agriculture, commerce, education, health, defence amongst others. The transport sector has been the subject of discussion because its product is used for all segments of any nation's economy (Biau et al., 2008). Amos (2004) substantiates this by acknowledging the diversity of the transport sector as the most varied of all infrastructure sectors. The variability of the product and market of the transport sector shows that it is distinct and unique from all other industries across the world.

Despite the importance of the transport sector and the level of PPP procurements of its products (especially road projects), there are issues faced by the transport projects, i.e., roads, seaports, rails, and airports like any other infrastructure projects. These problems vary from country to country. They could border on transportation strategy, funding, implementation challenges such as length of agreements, conflicting objectives of the partners, non-compete clauses, and renegotiations, (Acerete et al., 2010). The number of projects and transport projects investment according to the individual subsector is as shown in Table 2.2.

Table 2.2: Number of Projects and Transport Projects Investment by Subsector (1990 - 2016)

S/N	Subsector	Projects Reaching Financial Closure		Number of Countries with Private Participation		Total Investment (US$ Mill.)		Rank
		Number	%	Number	%	Amount ($)	%	
1	Roads	981	56	233	32	277,678	49	**1**
2	Seaports	448	26	255	34	81,409	14	**2**
3	Railroads	136	8	101	14	108,428	19	**3**
4	Airports	181	10	144	20	103,679	18	**4**
	Total	**1,746**	**100**	**733**	**100**	**571,194**	**100**	

Source: Adapted from World Bank PPI database (2016)

The evidence of Table 2.2 is corroborated by Akintoye (2009) and Biau et al. (2008), which state that the road sector is the most financial intensive of all the segments in any nation's industry, especially in the transport sector. This is because of the level of utilisation of its product and its capability of attracting and generating the highest capital outlay during implementation (Akintoye, 2009). The attention is based on their contribution to Gross National Product (GNP), coupled with the increasing need to adopt a more efficient procurement method that will provide VfM for all stakeholders in consideration of the massive project count and financial outlay involved in its execution. Road projects have high procurement rates in comparison with other projects of the transport sector, particularly in developing countries, and contribute immensely to the economic development and growth of any nation (Gor and Gitau, 2010; Biau et al., 2008).

Great importance and attention have been given to road projects by the stakeholders, particularly governments (Chowdhury, 2011). Road projects had been traditionally procured in the UK until the early 1990 (Mackie and Smith, 2005). The advent of PPP for the delivery of infrastructure projects introduced a shift from the traditional procurement method (Bowerman, 2007). The UK has been widely acknowledged as one early user of PPP for the delivery of significant infrastructure road projects (Shaoul et al., 2006; Shaoul et al., 2008). PPPs have been a primary delivery mechanism for the procurement of all types of infrastructure projects including road projects over the past years in many countries (Carrillo et al., 2008).

A cursory view of infrastructure projects procured using PPP method reveals that the total number of UK infrastructure projects obtained since the inception of PFI is over 800 PPP projects, worth a total capital value of over £56 billion (Treasury, 2014). Road projects constitute significant numbers of ongoing PFI projects in the UK (HM Treasury, 2014). Estache et al., (2000) identifies road projects as having a history of dominance of the transport sector across the world. Research shows that most UK PPP projects are concentrated in England and account for the highest capital value (Partnership UK, 2014; Roy, 2008). This is followed by Scotland, Northern Ireland, and Wales respectively (Partnerships UK, 2014). Other countries such as Spain and Portugal have been acknowledged as having significant experience in the provision of road projects using private finance (Stafford et al., 2010).

An examination of PPP procurement in road projects revealed that specific issues are impeding the successful implementation of road projects (Sarmento, 2014; Baeza and Vassallo, 2010). It is, therefore, expedient to review the issues bordering on the implementation of PPP road projects to establish the principal areas where the successful execution has been impeded. The high project count and financial implication of PPP road projects makes the issue of implementing the risk allocated, budgeted time, quality and VfM critical for the project's stakeholders and implementers. Since the transfer of risk is a government's fundamental justification for PPPs, there is the need for substantial risk transfer by the governments in the case of PPP road projects because of the high financial implication of the investment (English, 2006).

The implementation stages where there are paramount challenges are the contractual and post-contractual stages of PPP arrangement (Rouhani and Niemeier, 2014). The approach to check PPP projects during implementation has been identified as shown in Figure 2.1 and encompass the sphere of politics, law and institutions, economics and finance and execution, which all represent individual phases within the PPP project development. There is a need for effective implementation of PPP road projects at these phases due to the high capital outlay as shown in Table 2.2. In ensuring that PPP projects are successfully implemented, there is a need to ensure that international best practices are adopted using innovative approach within the critical phases of the project to ensure the achievement of the objectives of the public client. The public sector usually stipulates appropriate checklist to enhance the understanding of the private sector regarding the political, economic and institutional drivers of the project as well as the complexities inherent in the execution of projects during implementation (World Bank, 2014). The checklists foster an understanding of the issues to be considered during the implementation of PPP infrastructure project as shown in Figure 2.1.

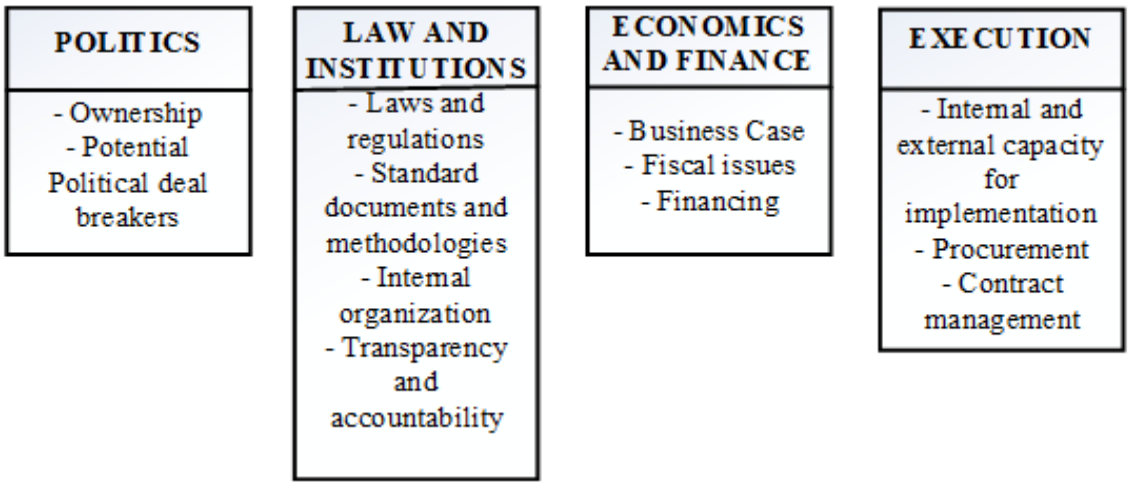


Figure 2.1: The Approach to PPP Checklist during the Project Implementation

Source: World Bank (2014)

Figure 2.1 indicates that PPP project ownership needs to be defined regarding project program plan and project rational as established by the procuring authority, which could either be the central, state and local governments including the project stakeholder's roles, responsibilities and support. The potential political deal breakers revolve around essential governments activities, social and environmental assessment, land acquisitions, the possibility of timely delivery and obtaining necessary approvals amongst other considerations. Deals regarding all these areas needed to be considered and concluded at this point during the implementation of PPP projects. Secondly, it is within the international norms that PPP infrastructure projects follow the dictates of a well-functioning and transparent legal and regulatory institutions, fiscal and financial frameworks, supportive and credible institutional processes, and the capacity and structures to implement them (World Bank, 2014). As shown in Figure 2.2, PPP institutional and legal frameworks address individual issues within the PPP processes ranging from approvals, procurement and regulation of the projects through construction to operation and maintenance stages amongst others. Hence, all legal and regulatory issues need to be considered at this point within the procurement process.

Moreover, documents should be prepared to ensure that there are standard methodologies and guidance for technical costs, value for money (VfM) analysis, economic cost-benefit analysis, affordability analysis, discounting, which have established benchmarks that can be assessed in comparison to international norms. The use of the standard methods will proactively assist in the evaluation of the project performance against the international benchmarks. World Bank (2014) identify the need for the development of documents and templates for different phases of the project, which define the rights and obligations of the parties and allocate risks to the entity best able to manage them. Moreover, the PPP governing structure, processes for appraisal, management and renegotiations of PPP contract need to be defined and established as part of the stages of work required during implementation. Modalities for ensuring transparency and accountability needs to be identified through the establishment of disclosure and audit framework by the public procuring authorities that guides the disclosure of post procurement, procurement and bidding information, performance audit amongst others.

Thirdly, considerations should be given to the economics of the proposed PPP development including the financing of the project as shown in Figure 2.2. The reviews should include the evaluation of the technical, economic, fiscal and financial sense of the proposed PPP development with an adequate critique of the business case and allocation of risks, which provides assurance that value for money will be achieved in the long term. Hence, all associated issues regarding the scope of the project, cost and revenues are established and accounted for within the PPP business case. A proper assessment of all the relevant issues including the site conditions will provide a

conclusion regarding the rationale for the preferred procurement option. However, within the project implementation stages, a rigorous assessment of the full range of project delivery options from traditional procurement to various PPP models need to be carried out to select the appropriate procurement method based on a robust assessment of VfM.

The PPP project should ensure that there is unique approach specific to the PPP project for the mobilisation of the internal and external actors and capacity required for the implementation of the project. The modalities for adhering to timelines need to be stipulated at the execution stage after proper evaluation of tendering and bidding documents. All issues associated with the management of the contract including all post-contract performance management should be equally considered. The post-implementation review should be undertaken to show the achievement of the expected outcomes or the level of achievement of the anticipated outcomes and VfM to establish or identify the need for mid-course corrections or remedial actions. It within the purview of PPP infrastructure project phases to ensure the management of renegotiations. The management of renegotiations according to World Bank (2014) indicates the need for the following:

- Identification of changes in the contract attributable to either the public authority or the private party that go beyond the provisions of the contract and that require renegotiation.
- The establishment of the renegotiation parameters and necessary approvals in place for initiation of renegotiation.
- Establish whether the project with the proposed amendments are affordable and will continue to provide VfM for the government.
- Establish the progression strategy and necessary timelines in a situation where renegotiation fails and does not yield the expected outcome for the public client.

Conclusively, the final stage of the PPP project is the completion of the term of the contract where there is usually an inspection of the asset by an independent expert to verify the asset condition and to ascertain whether it meets the hand-back standards or whether the assets requires rectification by any terms in the contract. During the completion of the duration of the PPP project, the public-sector client needs to ensure that termination compensation is paid out on hand back of the assets by the private partner as stipulated in the contract. Moreover, there should be a public-sector plan in place for management of the assets and continuity of services following the expiry of the contract including any process or plan for re-letting of the PPP contract.

There is the need for proper implementation of PPP projects to successful completion at every phase within the respective spheres to ensure that the defined objectives of the client are achieved. Though, the aspects of PPP projects development as indicated by some literature differ slightly from each other (Sarmento, 2014, Carrillo et al., 2008; Koppenjan, 2005). This study, however,

adopts that shown in Figure 2.1 as recommended by the World Bank (2014) since it is internationally accepted and follows international norms and practices. Moreover, the reason for the adoption is because it is all-inclusive and span across the entire PPP process from inception to completion.

2.6 PROCUREMENT OF PUBLIC PRIVATE PARTNERSHIP ROAD PROJECTS

The literature has attested to the many years of PPP projects delivery through the PFI model, especially in the road sector (Carrillo et al., 2006; Debande, 2002). One of the road projects proposed in 1980 and procured through PFI (DBFO) include the M6 toll road, which was the first toll motorway project in the UK (Pugh and Fairburn, 2008; Shaoul and Shaoul, 2008). These road projects involve invitations to the concessionaires to bid for the road projects, which are owned by the government. The condition is that the private company selected will also execute the operation and maintenance of the road for an agreed period, which in most instances is 30 years (Stafford et al., 2010). The public agency, however, must make a periodic payment as stated in the shadow toll agreement by the numbers of vehicles using the road (Perez and March, 2006). In the case of toll roads, the road users pay for the use of the road through the payment of toll fees.

The literature has identified that PFI method of project implementation primarily ensures VfM and sustainability in comparison with the traditional procurement method (Akbiyikli et al., 2011; Engel et al., 2010). Corroboratively, governments and other procuring authorities across the world have justified the adoption of PPP over the traditional method based on the higher management skills and expertise of the private sector including the use of private sector finance for infrastructure project delivery amongst others (Sarmento, 2014). Hence, the cumulative advantages of PPP lead to the conclusion made by the public client regarding the level of VfM generated in comparison with the traditional method of procurement. Other studies also confirm cost savings in PPP road projects (Cingolani, 2010).

To make a cost-effective, and economic investment decision, the procuring authority evaluate PPP in comparison with the traditional method of procurement through the Public Sector Comparator (PSC) at the feasibility and viability stage of project development. The PSC can be adopted as an evaluation method for the quantitative assessment of public sector VfM option, which usually serves as a financial benchmark against the PPP reference model. The public sector VfM option is represented as the costs of traditional procurement, which is compared with the PPP model to ascertain the feasibility stage of project development. This comparison is to allow the choice of the best option between the conventional, (i.e., traditional procurement method) and PPP methods of procurement regarding VfM (Grimsey and Lewis, 2005). Hence, there is usually the need to consider the cost of delivery of the project regarding the adoption of traditional

procurement method in comparison to the cost of delivering the project by PPP to complete VfM analysis at the design and planning stage. In the analysis of VfM, there is the comparison of the PSC model and the PPP reference model based on the benefits and merits obtainable from each of the model. However, lack of adequate information at the feasibility stage of the project could constitute difficulty in the choice of the best option regarding VfM.

In most instances, the VfM analysis based on the use of the PSC has led to the choice of PPP as the best option to procure infrastructure projects. Moreover, the literature states that the many advantages of PPP over the traditional procurement methods led to its full acceptance and adoption in the delivery of both toll and non-toll UK road projects (Bowerman, 2007). However, notable literature attests to specific areas of failures of PPP in the delivery of toll road projects, mainly based on cost and time overruns (Reeves, 2004; Reeves, 2003). The findings of these two kinds of literature contrast other PPP studies, which indicates more benefits regarding cost and time taken to deliver infrastructure projects.

PPP/PFI road projects delivery in Ireland has, therefore, been identified as having shortcomings, which include: delay, time and costs overrun that are higher than those experienced on contracts procured on traditional procurement basis (Reeves, 2003). These time and cost overruns pose problems to the achievement of VfM in PPP road projects and are attributed to the level of efficiencies, enormous costs of finance and the defective tendering and bidding process. Despite the shortcomings observed in the adoption of PPP for infrastructure project delivery, governments have continued to utilise PPP because of the many advantages, especially regarding the provision of solutions to their respective financial constraints and the higher level of efficiency, expertise and workforce of the private sector amongst others (Sarmento, 2014).

Having defined VfM at the early stage of this chapter and emphasised the importance of achieving the respective criteria, the occurrence of time and cost overruns established from the literature are attributed as a factor threatening the enthusiasm of the private sector for investing in road projects (Reeves, 2004). Though, the profits generated by the private sector partner has been a source of concerns as well to the public client and has also reduced the confidence of the public sector because of the VfM generated for the road users (Sarmento, 2014). Therefore, the findings suggest that the achievement of VfM has caused agitations and inconclusive arguments among the stakeholders especially the public and private sector partners and no project can lay claim to its full performance during the process of implementation. Hence, there is need to investigate the achievement of VfM in PPP road projects, especially in the context of UK PFI (DBFO) road projects. The reason for the need to examine PFI (DBFO) is in consideration of the long history of PPP adoption for road projects delivery.

2.7 ROAD PROJECTS IN THE UK

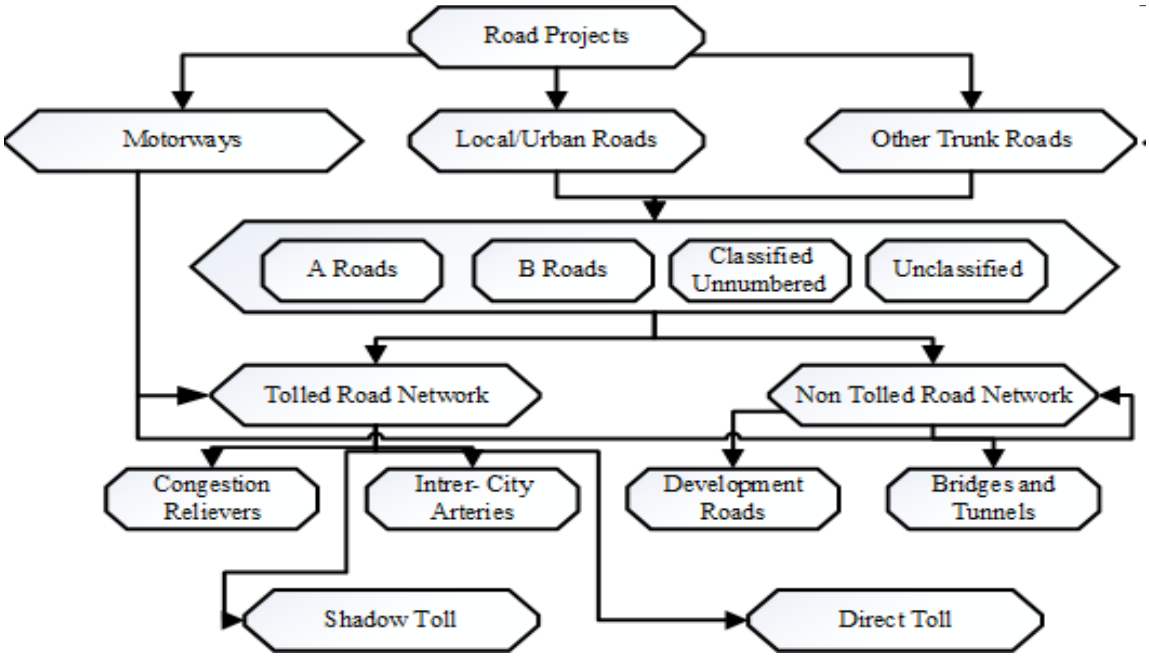
There are various types and classification of road projects. The road network of the UK has been categorised into motorways, trunk roads and local and urban roads, which is about the same categorisation with the road networks of twenty-nine countries of the world (Doll and Van Essen, 2008). All the categories of road networks are adopted to varying degrees across countries. However, the respective levels of adoption of each of these classes of road projects in the UK road sector is as shown in Table 2.3.

Table 2.3: Road Classes in the UK and their Level of Adoption

Country	**Motorways (Number)**		**Other trunk roads (Number)**		**Local/ Urban (Number)**	
	Total	Tolled	Total	Tolled	Total	Tolled
United Kingdom	3,638	42	47,928	-	364,689	-

Source: Adapted from (Doll and van Essen, 2008)

The model of PFI road projects in the UK, which constitute 60% of all roads in the UK fall into any of this forms and classifications (Doll and van Essen, 2008). Further findings on road services provision in Europe reveals that all the types of road projects can be referred to as tolled and non-tolled road networks. Toll roads are relatively short roads, classified as congestion reliever, inter-city arteries, development roads, bridges, and tunnels, and are constructed to relieve heavy traffic congestion on existing urban routes (Doll and van Essen, 2008). These roads attract user charges, which are either paid by the users or on behalf of the users (Soomro and Zhang, 2013; Abdel Aziz, 2007b). All other roads are categorised as non-tolled. When toll levies, taxes or fees are paid directly by the users, such payment can be regarded as a direct toll (Akbiyikli and Eaton, 2005). However, a payment mechanism, which provides that the government or the public agencies representing the state pay fees, levies or a tax for the use of roads, is called a shadow toll (Abdel Aziz, 2007b). The model of PFI road projects in the UK based on their respective types and classifications are shown in Figure 2.2.



Source: Adapted from (DoT, 2012; Doll and Van Essen, 2008)

Figure 2.2: Model of Road Projects in the UK.

Information from Figure 2.2 indicates that the local and urban roads in the UK constitutes major roads followed by other trunk roads. Motorways (particularly tolled roads) are the least procured roads in the UK. Furthermore, UK Department of Transport (2012) corroborates this finding providing the information of Britain's roads classification (excluding motorways) as follows:

- Class A roads are major roads intended to provide large-scale transport links within or between areas. It constitutes the highest class of classified road and the top tier of the road's classification.
- B roads are intended to connect different areas and to feed traffic between class A roads and smaller roads on the network. This category of roads is regarded as the second tier in the classified road system.
- Classified unnumbered roads are Smaller roads intended to connect unclassified roads with A and B roads, and often linking a housing estate or a village to the rest of the network. Like 'minor roads' on an Ordinance Survey map and sometimes known unofficially as C roads. It represents the third class of classified road and a tier in the roads classification system.
- Unclassified roads are local roads intended for local traffic. It is the fourth and lowest class of detailed road in the classification system. The majority (60%) of roads in the UK fall within this category. Though, local and urban roads network have been put ahead of all other road networks in the UK.

2.7.1 The Type of Public Private Partnership for UK Road Projects

Public Private Partnership in the context of a business enterprise has been defined as a situation where the private sector finances and shares the risks and rewards of business investment with the public sector (Shaoul et al., 2008). The PFI is a PPP type, which adopts the finance provided by the private sector for the delivery of infrastructure projects (Akintoye et. al., 2003; Debande, 2002). The types of contract structure adopted in the UK for infrastructure projects delivery especially in road projects of the transport sector are DBFO such as freestanding projects, concessions or franchises (Akintoye, 2009).

The DBFO is a PFI method of procurement usually adopted for road projects delivery in the UK (Debande, 2002). The reason for the adoption of PFI in the UK according to Carrillo et al. (2006) is to improve the level of public services. In the DBFO arrangement, the government makes payment for the utilisation of the road asset over a specified period of thirty years, e.g., the A55, A13, A74 (M) / M74, which are freestanding projects and concessions. The private concessionaire charges the users directly in the form of tolls and fees on a toll road, e.g., British M6 toll road or Dartford Bridge (Debande, 2002). Freestanding projects, concessions, and franchises emerge in a situation where there is a mix of both public and user charges in the partnership arrangement. These are opposed to the joint venture or joint ownership arrangements of PPP where either the public sector or the users may be charged for the services provided (Shaoul et al., 2008).

In general, DBFO is a PFI arrangement for transport projects (especially roads) procurement in the UK (Shaoul et al., 2006). In this arrangement, the Highways authority other procuring authority buys the road service provision for about 30 years instead of buying the capital assets or procuring through the traditional procurement method. The primary objective of the adoption of DBFO for road projects is the provision of quality public services, which constitute VfM for the users, taxpayers and public-sector client. Hence, VfM is a significant consideration in ascertaining whether to procure an asset through PPP (Akbiyikli et al., 2011). The primary objectives of DBFO road projects are to maximise VfM through appropriate allocation of risks between the public and private sectors towards ensuring the construction, operation and maintenance of new roads with minimal adverse impact on the environment, maximum benefit to road users and minimum financial contribution from the public sector (Shaoul et al., 2006). Technical, operational, financial and commercial innovation is the aim of PFI (DBFO) road projects.

The essence of using the private sector's entrepreneurial skills is to achieve significantly more VfM for the taxpayer than the conventional or traditional method of road projects procurement (Shaoul and Shaoul, 2008; Shaoul et al., 2006). For instance, the DBFO procurement method has been found to offer substantial savings in comparison with conventional procurement method

with a total of at least £100 million savings in infrastructure cost, which is about 13% of the contract sum (Grimsey and Lewis, 2007a). Contrastingly, other PPP studies have identified the non-achievement of VfM within infrastructure projects delivery, particularly road projects in Portugal and Spain (Acerete et al., 2010; Baeza and Vassallo, 2010; Shaoul, 2005). These suggest that the outcome of PPP infrastructure projects varies within project environment and across countries. Other studies corroborate these finding as revealed from the result of Latin America and Caribbean countries, which claim non-achievement of VfM in PPP road projects (Guasch et al., 2014; Bitran et al., 2013). Though, other studies have indicated the achievement of VfM mainly on the first eight PFI (DBFO) road projects in the UK (Bain, 2010).

2.7.2 Characteristics and Stakeholders of PFI Road Projects in the UK

The evidence available from numerous sources provides vital information concerning UK exposure to PFI in the road sector via the Design-Build-Finance-Operate (DBFO) model. The number and types of road concessions and highway maintenance project in the UK (excluding street lighting and highways offices projects) and their procuring authorities including the capital value of the projects are shown in Table 2.4.

Table 2.4: Privately Financed Road Projects in the UK

Public Authority	Type of Concession	Number of Concessions	Capital Value (£M)
Highways England	DBFO & Free standing with user tolls	14	2, 827.30
Scottish Office/ Executive and Agencies	DBFO/Free standing with user tolls, with contribution from the public sector for the infrastructure and later the tolls	4	609.70
Welsh Office/ Assembly/ Development Agency	DBFO (Excluding the non-devolve projects)	4	236.40
Northern Irish Department for Transport/ Road Service Agency	DBFO	2	365.00
Local Authorities in England	DBFO	8	1,846.00
Transport for London	DBFO	2	327.40
Total		**34**	**£6,211.80**

Source: Adapted from (PPI Database, 2016; Roy, 2008)

As illustrated in Table 2.4, England has the highest concentration of privately financed road projects in the UK with 14 current projects, which constitute 43.75% at £2,827.30 million capital value for all the roads and highways maintenance projects. Data for the current PFI (DBFO) road projects of the remaining countries represented in the UK are also indicated in Table 2.3. Scotland and Wales recorded four PFI (DBFO) road projects each while Northern Ireland private sector invested in two PFI road projects on a DBFO basis.

The data available from the PPI Database (2016) reveal 34 current road transport projects including highway maintenance projects of local authorities and excluding the cancelled and terminated projects, which include the project initiated by the Welsh Development Agency, which is no longer in existence (See Table 2.4 and Table 2.5 respectively). An evaluation of this extensive list of PFI (DBFO) road projects reveals that only 25 road projects could be attributable to roads and highway maintenance sector, which resolves into 14 roads and highway maintenance projects procured by the Highways England. Four DBFO roads are obtained by the Scottish and Welsh office individually, and two projects are attributable to DBFO road procured by the Northern Irish Department for Transport/Roads Service Agency as shown in Table 2.4.

The total number of the road and highway maintenance projects in England, Scotland, Wales and Northern Ireland including other details concerning the concession projects, which includes the procuring authority, SPV and equity holders amongst others are as shown in Table 2.5.

Table 2.5: Details of DBFO Roads and Highway Maintenance Projects in the UK

S/N	Project Name	Date of Financial Close	Date of Construction Completion	Contract Period	Capital Value (£ Million)	Equity Holder Details (Name &Share %)	Procuring Agency
1	A1 Darrington to Dishforth	01/02/2003	Data not provided	33	245	1st- Semperian PPP Investment Partners 2nd- Barclays Private Equity (BPE) (41.7%) 3rd Kellogg Brown & Root Limited (25.0)	Highway Agency
2	A1(M) Alconbury to Peterborough	01/02/1996	Data not provided	2mnb7	128	1st- Abertis Motorways UK Ltd (33.3%) 2nd- Barclays Private Equity (BPE) (41.7%) 3rd- Kellogg Brown & Root Limited (25.0)	Highway Agency
3	A19 Dishforth to Tyne Tunnel DBFO	01/10/1996	02/09/1998	30	29	1st- Sir Robert McAlpine Enterprises Ltd (100.0%)	Highway Agency
4	A249 Stockbury to Sheerness	01/02/2004	Data not provided	30	73	1st- Barclays Integrated Investment Fund (50.0%) 2nd- HICL Infrastructure Company Limited (50.0)	Highway Agency
5	A30/A35 Exeter to Bere Regis	01/07/1996	01/07/2000	30	75	1st- Balfour Beatty Plc (20.0%) 2nd- Barclays Private Equity (BPE) (15.0%) 3rd- Equitix Holdings Ltd (65.0%)	Highway Agency
6	A417/A419 Swindon to Gloucester	01/02/1996	16/01/1998	30	110	1st- Abertis Motorways UK Ltd (33.3%); 2nd- Barclays Private Equity (BPE) (41.7%); 3rd- Kellogg Brown & Root Limited (25.0%)	Highway Agency
7	A50/A564 Stoke to Derby Link	01/05/1996	Data not provided	30	21	WS Atkins Investments Ltd - Balfour Beatty-	Highway Agency
8	A69 Carlisle to Newcastle	01/01/1996	Data not provided	30	9	1st- Henry Boot Construction Ltd (61.2%) 2nd- Pell Frischmann Concessionaires (18.8%) 3rd- Societal Initiative Autostadali e Servizi S.p.A (SIAS) (20.0%)	Highway Agency
9	M1-A1 Lofthouse to Bramham Link	01/03/1996	Data not provided	30	214	1st- Balfour Beatty Plc (50.0%) 2nd- Barclays Private Equity (BPE) (50.0%)	Highway Agency
10	M40 Denham to Warwick	01/09/1996	Data not provided	30	65	1st- John Laing Infrastructure (50.0%) 2nd- Semperian PPP Investment Partners (50.0%)	Highway Agency
11	M6 Toll Road (Formerly Birmingham Northern Relief Road BNRR)	01/02/1992	Data not provided	46	485	Macquarie Infrastructure Group (MIG) (100.0%)	Highway Agency
12	National Roads Tele-communications Serv.	01/09/2005	01/03/2008	9	54.2	1st- HSBC Infrastructure Fund Management Ltd. (55.0%) 2nd- Fluor International Ltd. (45.0%)	Highway Agency

Table 2.5: Details of DBFO Roads and Highway Maintenance Projects in the UK (Contd.)

S/N	Project Name	Date of Financial Close	Date of Construction Completion	Contract Period	Capital Value (£ Million)	Equity Holder Details (Name &Share %)	Procuring Agency
13	M25 Orbital	20/05/2009	01/04/2013	30	988.1	1st- Balfour Beatty Plc. (40.0%) 2nd- Skanska (40.0%) 3rd- WS Atkins (10.0%) 4th- Egis Projects SA (10.0%)	Highway Agency
14	Severn River Crossings	01/10/1990	05/06/1996	30	331	1st- John Laing Plc (35.0%) 2nd- Vinci Concessions S.A.S Grupo ACS 3rd - Barclays PLC (15.0%) 4th- Bank of America (15.0%)	Highway Agency
	LOCAL AUTHORITIES						
15	Carlisle Northern Development Route	15/07/2009	10/02/2012	30	60.1	1st - Balfour Beatty Infrastructure Investments Ltd. (82.4%) 2nd- Reliance (17.7%)	Cumbria
16	A130	01/09/1999	Data not provided	29	97.5	John Laing PLC. (100.0%)	Essex
17	Portsmouth Highways Maintenance	01/07/2004	01/04/2009	25	63.1	1st- Colas SA (50.0%) 2nd- Colas Ltd (50.0%)	Portsmouth
18	Doncaster Interchange	01/12/2003	Data not provided	32	200	Data Not Supplied	South Yorkshire
19	Birmingham Highway Maintenance	06/05/2010	01/04/2015	25	322	1st- Amey Investments Ltd (33.3%) 2nd- Lloyds (Uberior Fund) (33.3%) 3rd- Equitix Ltd (33.3%)	Birmingham
20	Sheffield Highways Maintenance	31/07/2012	01/09/2017	26	369	1st - Amey Ventures Asset Holdings Limited (33.34%) 2nd -Equitix Highways 2 Limited (33.33%) 3rd- Aberdeen Asset Mgt. Ltd.	Sheffield
21	Mersey Gateway Project.	28/03/2014	31/03/2017	30	589	1st- Macquarie 2nd- FCC 3rd –Bilfinger	Halton
22	Isle of Wight Council - Highways Maintenance	26/09/2012	31/03/2020	18	145.3	Island Roads Services Ltd	The Isle of Wright
	TRANSPORT FOR LONDON						
23	A13 Thames Gateway DBFO	12/04/2000	30/09/2006	30	230.4	1st- AMEC (25.0%) 2nd- Carillion (25.0%) 3rd- Kellogg Brown & Root Limited (25.0%) 4th- Grupo ACS (25.0%)	Transport for London
24	London Borough of Hounslow Highways Maintenance	30/08/2012	31/12/2017	20	97	1st- Vinci Infrastructures SAS (50.0%) 2nd- BIIF Holdco Ltd. (50.0%)	Hounslow
25	MOT Computerisation	01/02/2000	Data not provided	11	57.7	Siemens AG 100% (this is a corporately financed project)	Department for Transport
	SCOTTISH SCHEMES						

Table 2.5: Details of DBFO Roads and Highway Maintenance Projects in the UK (Contd.)

S/N	Project Name	Date of Financial Close	Date of Construction Completion	Contract Period	Capital Value (£ Million)	Equity Holder Details (Name &Share %)	Procuring Agency
26	M6 DBFO	01/4/1997	-	30	96	Innisfree Nominees Ltd (60%) Laing Roads Ltd. (20%) PFI Investors Ltd (20%)	Scottish Executive and Agency
27	Skye Bridge,	-	1995	-	-	Terminated	Terminated
28	M77 / Glasgow Southern Orbital Road (SE / East Renfrewshire)	30/05/ 2003	Spring 2005	32	135.0	Balfour Beatty Capital Projects Ltd. (85%) Infrastructures Investors Ltd (15%)	Scottish Executive, East Renfrewshire Council (ERC)
29	M80 Stepps to Haggs	11/2008	09/2011	30	320.0	HICL Infrastructure Company Limited	Scottish Executive and Agency
30	A74 (M)/M74		05/12/2008	30	65.0		Transport Scotland
	WELSH SCHEMES						
31	A55 Llandyygai to Holyhead Trunk Road	01/12/1998	08/2001	30	120.0	UK (Highways (A55) Holdings Ltd (100%)	National Assembly for Wales
32	Newport Southern Distributor Road	29/3/2002	-	37	57.1	Morgan Sindall Investments Limited (50%) Innisfree (50%)	Newport CBC
33	Lloyd George Avenue & Callaghan Square	09/7/1999	2007	25	189.0	Vinci Pensions Ltd (60%) Laing Road plc (20%) and PFI Investors (20%)	Former Cardiff Bay Development Corporation (now Welsh Assembly Government)
34	Sirhowy Enterprise Way Road Scheme	21/01/2004	12/2005	30	35.9	Costain Civil Engineering & Construction Ltd. (50%) Costain Engineering & construction Ltd. (50%)	Caerphilly County Borough Council Caerphilly (CCBC)
35	Severn Crossing (Non-devolved Project)	01/10/1999	05/06/1996	30	331	Cofiroute UK Limited and Laing O'Rourke. Prudential Trustee Company Limited and Prudential Assurance Company Limited mutual interest in ordinary shares	Department for Transport
	NORTHERN IRISH SCHEMES						
36	DBFO1 M1/ Westlink/M2/M3	02/2006	11/2009	30	115.00	Highways Management Group (HMG). HMG (GRAHAM, Northstone Ltd and Bilfinger Berger). 33% each.	Department for Infrastructure
37	DBFO II Northern Ireland	12/2007	01/2011	30	250.00	Bilfinger Berger Projects Investments S.C.A. SICAR (75%) Graham Investment Projects Ltd (15%) Northstone NI Ltd. (10%)	Department for Regional Development- Roads Service

Source: Adapted from (HM Treasury, 2016; PPI Database, 2015; PPP Forum, 2011)

Out of the 25 PFI projects in England as shown in Table 2.5, only 14 can be categorised as involving roads and highway maintenance. The remaining 11 DBFO road projects are mainly electrification and street lighting requiring some operation and maintenance at the local authorities and Transport for London procuring agency.

Different types of financing and funding regimes are in place and adopted. These road projects are contracted within an agreed contract period. However, there are options for renegotiation and termination of the contract. The associated details and addresses of the respective government agencies, private companies, and the individual shares of the equity holders involved in the procurement of the PFI (DBFO) road projects in the UK are numerous. However, the details of the public and private sector stakeholders are shown in Table 2.5.

Table 2.5 shows that the responsibility of Highways England includes the procurement of most DBFO road projects in the UK (mainly in England). Other public-sector procuring authorities' Northern Irish office, Scottish office, and Welsh office. Autolink Concessionaires and Midland Expressway Ltd amongst others are all examples of DBFO private companies operating in Scotland.

2.8 CHALLENGES ASSOCIATED WITH PUBLIC PRIVATE PARTNERSHIP ROAD PROJECTS

The implementation of PPP road projects to successful completion at every phase of the PPP projects is essential particularly in the achievement of the VfM objectives of the primary partners. Critical assessment of existing literature indicates that there are various implementation themes for PPP road projects (Verweij, 2015; Rouhani, 2009). The implementation topics borders on VfM issues, risk management system issues, quality management systems issues, legislative and institutional framework, problems regarding the achievement of specified construction time/project duration, especially about the A15 motorways, which is a road connecting Rotterdam and the interchange Ressen in Netherlands (Verweij, 2015). The implementation of budgeted cost or contract and the implementation of project profit or proposed investment return, however, constitute important project implementation themes.

Nevertheless, existing literature on PPP implementation at the respective stages identifies some implementation issues on PPP projects executed in the USA. These issues include and not limited to: sustainability, conflicting objectives of private and public, lengthy agreements and stability of accord, non-compete clauses, renegotiations, flexibility in pricing, fixed-term franchise, interoperability of the entire network, social and physical events, environmental constraints,

political support, stakeholder's management, amongst others (Rouhani, 2009). However, one of the leading implementation challenges for infrastructure projects procured through PPP in Latin America and Portugal has been found to be renegotiation (Guasch et al., 2014; Sarmento, 2014). Research conducted in Spain has also identified renegotiation as one of the issues impeding the successful implementation of PPP projects, especially in the road sector (Acerete et al., 2010; Baeza and Vassallo, 2010). The reason why renegotiation is one of the prominent problems of PPP is premised on the findings of the literature, which states that it has a direct implication on VfM criteria through the increase in concession cost and completion time (Sarmento, 2014; Guasch et al., 2014). However, empirical investigations are necessary to uncover these areas in the context of some countries including the UK. Also, renegotiation impacts the outcomes of the renegotiation negatively during the implementation of PPP road projects (Acerete et al., 2010; Baeza and Vassallo, 2010).

There is the need to efficiently manage renegotiations to achieve acceptable and satisfactory outcomes in PPP road projects. This need is based on accounts concerning PPP road projects and the challenges militating against efficient and effective road provision. There have been suggestions in Germany on the need to put specific measures in place to ensure effective implementation of PPP framework for road projects (Fischer et al., 2006). Also, the need to put in place a framework to address the constraints posed by the cost and time overruns, transparency issues, environmental challenges has been emphasised in India towards successful implementation of PPP infrastructure projects through responsive and innovative measures (Lakshmanan, 2008; Nataraj, 2007). Hence, necessary actions can deliver the objectives of the stakeholders and address the challenges inherent in the implementation of PPP infrastructure projects including roads.

Value for money (VfM) has been defined as the combination of the costs, risks, completion time and quality throughout the whole life of a project to meet public requirements (Grimsey and Lewis, 2005). VfM in road projects borders on proper risk transfer, quality of transport products, completion of the project within the specified time, achieving sound cost and returns within the infrastructure life and the transfer of the project to the government at the end of the partnership as agreed in the contract based on the project residual value. Client's satisfaction, project cost, risk transfer and performance of road projects are paramount considerations when deciding to implement road projects for value for money.

The current practice in the UK regarding PFI road projects based on the analysis of different case studies reveals the need for a long-term perspective of VfM by all the stakeholders in a PPP arrangement, especially at the inception of the contract (Akbiyikli et al., 2012). Though, PPP has been identified as a method of implementing road projects to ensure a sustainable outcome than

what is achievable in the traditional method of infrastructure projects procurement (Akbiyikli et al., 2011). However, VfM variations in PFI projects in the healthcare and transport sectors has been established in the literature, which indicates uncertainty in the VfM assessment results of PFI projects in both roads and healthcare sector (Henjewele et al., 2011). These suggest that there may be variations and changes in costs, timescales and client requirements during the implementation process of PFI projects in both transport and healthcare infrastructure sectors. Debande (2002) agree that risk transfer in UK PFI projects leads to the reduction of construction costs with relatively high transaction costs during project implementation. Based on the VfM variations, which exist in some instances of PPP transport projects evaluated, the VfM assessment of transport projects tends to differ considerably across a range of projects and models. Hence, there is the assumption from this experiences that VfM regarding cost is also an implementation issue in PFI infrastructure projects delivery in the UK.

The findings of the literature also confirm cost savings in PPP road projects (Chang, 2013; Willoughby, 2013; Cingolani, 2010). Though achieving transparency between the stakeholders within the process of PPP implementation remain a challenge (Lakshmanan, 2008). PFI reduces construction costs by risks transfer to the private sector, which notwithstanding does not in any way remove the high transaction costs of PFI during the transport projects implementation in the UK (Debande, 2002). These transaction costs are generated during the pre-implementation and implementation stages of the PPP process and constitute significant implementation issue in PPP projects in the UK. However, the transactions costs, which emerge as a procurement issue borders on several challenges, which include and not limited to principal-principal problems, renegotiation & hold-up problems, and soft budget constraints (Ho and Tsui, 2009). These challenges are also regarded as problems that could mitigate effective PPP road project implementation (Guasch et al., 2014; Sarmento, 2014).

Evidence from existing literature shows lack of empirical information regarding PPP renegotiation, especially in the UK (Makovsek et al., 2015). There is a need to extend the theoretical knowledge to reduce the variations in VfM usually achieved across PPP projects during the implementation of transports projects and address the incidences of high transactions costs, especially as it relates to renegotiation. Moreover, the motive of any private investor in PPP is to recoup the expenses incurred in the projects in its entirety. Construction costs, cost of finance, risks, and all other associated costs, etc. Any investment, which will not yield return or profits and VfM for the users, is unattractive to both the public and private investor and not worth the investment. Thus, the benefits of the private investor and VfM for the public project are considerations, which should be taken seriously during the implementation of road projects. As

results, PPP road projects should be implemented to yield maximum VfM returns for the public sector without compromising profitable returns to the private sector.

Time is another variable in PPP road projects, which is relative and requires critical investigation because of its impact on VfM (Engel et al., 2014; Bitran et al., 2013; Ho and Tsui, 2009). As contract duration and the concession period are vital to both public and private partners, there is usually the need to consciously ensure that there is no adverse impact, which could negatively impact the project deliverables regarding duration. In doing so, there is the need to critically appraise PPP road projects from real life experience to investigate the level of implementation success concerning the timely delivery of the road project at the construction and operation stages.

Attitudinal behaviour also constitutes implementation challenge in PPP infrastructure projects. The attitudes of the stakeholders within the tender, design and construction phases of UK PFI (DBFO) road projects have an impact on the quality, cost and function of the product of PPP arrangement supplied to the users (Hall, 1999). The study further reveals that attitudinal change by the stakeholders during PPP implementation tends to affect the quality and other VfM criteria. For instance, negligence or nonchalant attitude of the managers or operatives during the construction or operation stage of PPP road project could impact negatively on time and cost because of delay that can arise in the execution of works. Therefore, an assessment of attitudinal barriers, which influences VfM at the planning and construction stage, is germane towards effective PPP infrastructure implementation.

Galilea and Medda (2010) probe the implementation of PPP transport projects on countries basis. The findings of this recent study conducted on the premise of the six countries experience revealed that corruption level and democratic accountability impact on PPP transport projects success. The research also indicates that change in democratic government and political instability has a significant effect on the successful implementation of transport projects. These imply that successful implementation of transport projects is also a function of the stability of the political system of the host country. Thus, the unfavourable political climate tends to be unattractive to private investors as it is usually difficult to implement PPP road projects in such a situation.

A further challenge in PPP transport projects falls within the remit of the provision of the legislative and institutional framework of countries (Willoughby, 2013; Medda et al., 2013). Medda et al. (2013) establish that the impacts of EU institutions or PPP units in the development and success of financial management for the transport sector in Europe cannot be over-emphasised. These are to ensure effective and efficient implementation of the budgeted cost of the projects. Therefore, lack of these PPP institutions and units constitute the challenge to PPP projects implementers because of lack of useful parameter for the management and operation of PPP.

Numerous studies have proposed solutions to these issues, which has become challenges in PPP implementation, especially in the transport sector. Rostiyanti and Tamin (2010) suggest the need to solve the problems facing the implementation of PPP in toll road projects through performance policy framework to enhance the PPP approach in toll road development while Adetola (2014) developed conceptual, collaborative engagement framework for road transport infrastructure management. Also, a model through a partnership framework that will encourage the involvement of the private sector in PPP road projects in Kenya has been proposed (Gor and Gitau, 2010).

Furthermore, Willoughby (2013) states the need for assisting developing countries in public transit provision through adequate monitoring systems, progressive policies and federal institutional frameworks for the practice of PPPs among others. Though, these studies recognise that there are challenges experienced in the implementation of PPP in the delivery of infrastructure transport projects. However, none of the studies has been able to address the current problem encountered at renegotiation, budget constraints and hold up issues constituting significant challenge regarding VfM achievement for the stakeholders. Hence, the need for the development of a framework to address this critical challenge in PPP road projects delivery cannot be over-emphasised.

2.9 SUMMARY OF THE CHAPTER

The chapter reveals that public agencies across the world, especially in the UK are now adopting PPP for infrastructure projects delivery because it fosters efficiency and delivers VfM for the stakeholders. Though, there have been conflicting arguments regarding the merits of PPP over the traditional method of infrastructure project procurements. The chapter, however, indicates that road projects constitute the most significant infrastructure projects that are procured through PPP across countries. The high financial implications of road projects for both the private investor and governments has been identified as the main reason why clients favour PPP for road projects delivery. This is because the procurement method affords the government the utilisation of the private sector financial resources and higher-level management skills and expertise. The high capital intensity of PPP road projects is the justification for the reason why its implementation is critical, especially regarding the achievement of VfM.

PPP has also been recognised as a unique model of procurement that is formulated to positively affect the economic, quality, environmental and social aspects of road projects to provide VfM to the public partner, return on investment (profits) for the private sector and satisfaction for the users. However, in most situations, there is inefficiency in the management of the risk allocated, budgeted cost and construction time during the phases of PPP projects. The outcome of the literature also indicates that one of the emerging challenges and issues in PPP procurement

impacting cost and time amongst others is renegotiation. In fact, renegotiation is one of the most critical problems impeding the successful implementation of PPP contracts. Therefore, based on the appraisal of relevant studies across PPP practising countries concerning the procurements of infrastructure PPP projects, the focus of the next chapter is on the renegotiation of PPP projects.

CHAPTER 3 RENEGOTIATION IN A PUBLIC PRIVATE PARTNERSHIP ENVIRONMENT

3.1 INTRODUCTION

This chapter addresses Objective 2 of this thesis by investigating the incidence of renegotiation and identifying the factors leading to the renegotiation of PPP road projects. The section establishes renegotiation as an issue in PPP procurement, especially in road projects. Other problems emanating from the renegotiation in PPP road projects environment are discussed in this chapter. The renegotiation problems are observed to have a knowledge gap requiring further empirical investigation. Numerous research works have attested to the efficiency advantage of PPP in the procurement of infrastructure projects, including roads. Despite the perceived merits of PPP over other procurement methods, projects undertaken by this approach have faced various challenges including the challenge of contract renegotiation.

The chapter, therefore, reviews renegotiation of PPP contracts based on the concepts and types of renegotiation, renegotiation leading factors and initiation of renegotiation. The behaviours of the parties to PPP contract, objectives of the stakeholders at renegotiation, outcomes, and impact of the renegotiation, and measures to ensure the achievement of VfM at renegotiation are in this chapter. The chapter concludes by summarising VfM as the principal renegotiation challenge and issue among other topical issues in PPP road projects.

3.2 THE CONCEPT OF CONTRACT RENEGOTIATION

A contract is an agreement between two or more parties, which is recognised by law as binding on the parties (Matheson, 2006). A valid contract subsists when the elements of a valid contract are present, and the procuring partners state the terms of the agreement. These conditions are indicated in the contract with a clause specifying the requirements of the contract for the parties' adherence during the implementation of the contract. The experience of contract renegotiation as stated in the literature, however, reveals that situation occasionally arise during the contract that may make the parties individually or jointly indifferent to the initial contract or agreement (De Brux, 2010; Bolton and Dewatripont, 2005). The renegotiation may also occur in a situation

where the terms of the agreement do not serve the needs of the parties as expected (Arino and Reuer, 2004). This circumstance may necessitate renegotiation of the contract.

Literature has abundant evidence of the descriptions of the concepts and processes of contract renegotiation (Ping Ho et al., 2015; Xiong and Zhang, 2014; Bi and Wang, 2011; Dainty, 2008). However, the occurrence of an event, which results in the adjustment of the contract is termed contract renegotiation. Sarmento (2014) corroborates this definition by indicating that renegotiation of the contract may result in compensation of a party to the contract usually by way of change in the financial conditions of a concession contract. Also, within a psychological contract, the employer and the employee may inform each other about the terms and conditions of the contract, which is usually open to negotiation, monitoring, renegotiation or cancellation (Dainty, 2008). Thus, renegotiation of a contract could occur after contract formation and during the implementation of infrastructure projects up to the end of the contract or the transfer of the contract to the procuring party.

3.3 RENEGOTIATION FROM PUBLIC PRIVATE PARTNERSHIP PROJECTS PERSPECTIVES

A critical review of renegotiation studies in PPP infrastructure projects revealed that there exist several descriptions of renegotiation. The literature presents numerous definitions of contract renegotiations in recent PPP studies (Makovsek et al., 2015; Guasch et al., 2014; Sarmento, 2014; Sarmento and Renneboog, 2014; Cruz and Marques, 2013a; Bi and Wang, 2011). Few kinds of literature have been able to uncover issues about the subject of renegotiation over the past years (Sarmento, 2014). As a result, research in this area has faced great difficulty concerning scarcity of literature to premise current studies in PPP renegotiation. However, there is an improvement in the past few years with respect to renegotiation studies on PPP renegotiation. Thus, numerous definitions of renegotiation in PPP studies have been identified from authoritative sources.

Guasch et al. (2014) define contract renegotiation in a PPP arrangement as a change in the terms and conditions of the contract agreed between the procuring entity and the private party at the inception of the contract. This change could be regarded as distinct from the payment adjustments, which occur as stated in the terms of the original contract. A renegotiation can also be agreed in a PPP contract in a situation where there is a major or significant amendment, which is not envisaged or expected at the time of signing the original contract (Nikolaidis & Roumboutsos, 2013; Guasch and Straub 2009).

The literature on PPP renegotiation in Portugal brings to the fore corroborative meaning of PPP renegotiation. Sarmento (2014) and Sarmento and Renneboog (2014b) refer to renegotiation [referred to as financial rebalancing or financial rescue agreements (FRAs)] as the occurrence of substantial departures from the original contract, which resulted in contract amendment or change of the contract. These definitions suggest that an unexpected event, incidence or occurrence could necessitate the revision or amendment of the original contract. Thus, renegotiation may be evidenced in the change of project scope, which may result into rebalancing the financial agreement or financially rescuing the project to avoid abandonment or contract incompletion.

Furthermore, Bi and Wang (2011) reveal that renegotiation could be considered as the negotiation, which takes place after the initial negotiation leading to the original contract. Rounds of negotiation may, therefore, happen in a situation where there is divergence opinion or differences in stakeholder's benefits and level of investments expected by the parties to the contract. The disagreement could be because of specific reasons or drivers, which are beyond or within the control of the parties to the PPP contracts. Cruz and Marques (2013a) also give another definition of PPP contract renegotiation from another dimension. The study identifies renegotiation as non-alignment of PPP contract terms with present circumstances, which result in a request for change by one or all the contracting parties. Hence, the inability or difficulty of contracting parties (government and the concessionaire) to comply with terms of the contract can result in renegotiation request.

These definitions corroborate the definition of Makovsek et al. (2015) on contract renegotiation in PPP, which describes renegotiation as a change in the risk matrix assignment of a project or a change in the contract conditions or project scope. These definitions suggest that renegotiation of PPP contract is an unexpected change in contract terms due to unforeseen events at the time of contract formation, which leads to the amendment of the original contract terms. These amendments could bring about a change in the agreed contract sum. However, in some situation, a clause may be stated in the contract saying that a renegotiation may occur, or the agreement may be subject to renegotiation (Sarmento, 2014). Therefore, all the selected definitions on PPP contract renegotiation provide a proper understanding of the subject and serves as a basis for relating previous studies to the need for further research.

The description of PPP contract renegotiation will be incomplete without an examination of the respective classes or divisions of PPP renegotiations in PPP infrastructure project transactions. Bi and Wang (2011) and Xiong and Zhang (2014) note that renegotiations could be divided into three types and categories according to the different initiators. These initiators are the contracting parties or partners, which agrees to pool their respective resources together for the achievement of mutual objectives.

3.4 CLASSIFICATION OF RENEGOTIATION TYPES

There are various types of renegotiations in the literature, which can be categorised and grouped into different classes. Since renegotiation of a contract could occur after contract formation and during the implementation of infrastructure projects up to the end of transfer of the contract, therefore, renegotiation can be classified according to the implementation stage where it occurs. Renegotiation can also be categorised by the party requesting the renegotiation. Fundamentally, renegotiation can be classified into two as discussed in this section.

3.4.1 Renegotiation Types According to Contract Implementation Stage

Three types of contract renegotiation are identified in the literature and include intra-deal, post-deal and extra-deal renegotiations. A renegotiation, which takes place at the end of the contract when the parties are free from all contractual obligations are known as post-deal renegotiation while a renegotiation, which occurs during the period of implementation is regarded as intra-deal renegotiations (Salacuse, 2000). The latter type of renegotiation may provide a specification that the parties may request contract renegotiation or ask for the review of the provisions of the terms of the contract. This type of renegotiation is peculiar to infrastructure construction contracts including PPP contracts (Salacuse, 2000). Renegotiation is regarded as an extra-deal when it violates the provisions of the contract or when there is no clause in the contract authorising a renegotiation. In this situation, the rounds of negotiation usually take place without reference to the framework of the existing contract. Hence, contract renegotiation in infrastructure projects (construction inclusive) could take the form of any of these categories.

3.4.2 Renegotiation Types According to Public and Private Partners Initiative

Renegotiation of a PPP project can be categorised according to the party requesting the opening of the renegotiation process. Many kinds of literature support this submission by stating that renegotiation request in PPP projects can be opened by either the public or private partner or both (Cruz and Marques, 2013a; Bi and Wang, 2011). Thus, renegotiations can be classified into three according to the stakeholder requesting as follows: renegotiation initiated by private enterprises/company, renegotiation started by the government, and renegotiation commenced by both private firm and the government.

Renegotiation initiated by the employer is regarded as employer-led renegotiation. However, in a PPP contract, the government can be considered as an employer. Therefore, the renegotiation requested or initiated by the government is referred to as the government led renegotiation while a renegotiation process undertaken by the employee or the private party is an employee-led or private party-initiated renegotiation (Lohhman and Rotzel, 2014; Ho, 2006). Most of the renegotiations initiated are targeted at ensuring that the changing needs are met towards the achievement of individual objectives of the contracting parties, i.e., both the public and private party. For instance, the goal of the client or procuring authority in a PPP arrangement is value for money for the users while the private concessionaire seeks to achieve the profit maximisation motive (Acerete et al., 2010; Reside and Mendoza, 2010; Ho and Tsui, 2009).

Moreover, renegotiation can also take place at the joint request or initiative of both the public party, i.e., government and the private party, which is frequently referred to as public and private parties led renegotiation (Cruz and Marques, 2013b; Bi and Wang 2011). In this case, both parties jointly agree to the renegotiation unlike the previous classes, which is strictly at the request of the individual party, i.e., the government or the private party. It is only after any or both parties have requested renegotiation that renegotiation of PPP contract can take place.

Xiong and Zhang (2014), however, opine that renegotiation requests are usually allowed in a concession contract to be made by the private partner to attract private finance and in a situation of severe risk, which could affect the profitability of the concession for the SPV. The implication is that renegotiation can take place at the request of one or both parties at any point in the implementation of PPP projects when a risk scenario occurs.

The literature has classified renegotiations initiated by private enterprises into two namely: opportunistic and cooperative renegotiations (Bi and Wang, 2011). Opportunistic renegotiations undertaken by a private company aim at gaining a maximum return either warranted or not warranted while the cooperative renegotiation is usually initiated bearing the interest of both parties in mind (De Brux, 2010; Guasch and Straub, 2009a). Though, the private enterprise stands to gain additional investment profit, especially in an opportunistic renegotiation. However, the additional profits gained by the private party is not at the expense of the client or the procuring authority in a cooperative renegotiation. In other words, opportunistic renegotiation can be initiated solely to satisfy the profit motive of the private enterprise while the latter is for the mutual benefits of the partners. The levels of renegotiation initiatives across PPP projects, especially within the respective modes of transports are shown in Table 3.1.

Table 3.1: Cross Country Analysis of PPP Projects Renegotiation Initiatives

S/N	PPP Projects	Literature	Makovsek et al. (2015)	NAO (2008)	Hasselgren et al. (2014)	Cruz & Marques (2013a)	Cruz & Marques (2013b)	Sarmento & Reis (2013)	Sarmento (2014)	Baeza & Vassallo (2010)	Acerete et al. (2010)	Guasch et al (2014)	Engel et al., 2014	Bitran et al. (2013)	Guasch and Straub, 2009a	Nikolaidis & Roumboutsos (2013)	Gifford et al. 2014	Engel et al., 2011	Lohhman & Rotzel (2014)	Vining & Boardman (2008)	De Brux et al. (2011)	Total	Rank
		Country/ Region	UK			India	Portugal			Spain		Latin America				Greece	USA		Germany	Canada	France		
1	Road Project					√		√	√	√	√			√		√	√	√			√	11	1
2	All Projects		√	√	√	√						√	√		√				√	√		9	2
3	Rail Project						√	√														2	3
4	Seaport Project						√	√														2	3
5	Airport Project																					0	5
	Renegotiation Initiator:																						
1	SPV and Government							√		√		√	√	√		√		√	√	√		9	1
2	SPV					√		√			√	√					√				√	6	2
3	Government		√	√	√		√		√													5	3

The experiences of renegotiations as shown Table 3.1 reveal that out of the infrastructure projects; road projects account for the highest number of PPP renegotiations most of which are initiated by both the government and the private operator. The findings from international PPP literature (See the 19 kinds of writing in Table 3.1) indicates that incidence of renegotiation in the US appears to be low, there is, however, no comprehensive research available to provide detailed statistics. Gifford et al. (2014), however, explicitly focused on cases where changes to the contract did occur. The evidence of the six cases studied indicates that only three could be regarded as renegotiations, whereas three were bankruptcies. In the US case studies there is also no clear-cut direction or principal reason for renegotiation as observed in the study of Gifford et al. (2014). However, the literature indicates that Florida only recorded scanty renegotiations with evidence of only one road project renegotiation out of 13 road sector PPPs renegotiated claimed to have occurred within the period, which was identified as emanating from the SPV.

In the UK, NAO (2008) reports the fiscal impact of changes to the contracts for the year 2006 in their survey of 171 PFI projects, which was identified based on statistics from all sectors. Unfortunately, a more comprehensive view of the impact of changes over the life of the projects is not available in the literature. The majority, i.e., 82% of modifications involved £5 000 or less (Hasselgren et al., 2014). Evidence from this literature suggests that all the changes originated with a request from the public sector rather than from the private sector contractor or because of a change in the law. In Portugal, the economic crisis prompted much of the national highway programme to undergo renegotiations while the poor or inaccurate estimation of traffic levels encourage request for the renegotiation of road concessions in Spain (Baeza and Vassallo, 2010).

Literature evidence reveals that no renegotiations have been allowed by the government up to the year 2014 in India. However, many PPP projects went into operation with confirmations of requests for renegotiation by the private parties, possibly due to overaggressive bidding. Adequate responses have been given to the problems of aggressive bidding through the minimisation of moral hazard in the bidding and project specification processes and reservation of renegotiation for the very exceptional circumstances (Hasselgren et al., 2014). Thus, the standard road sector PPP contract in India provides for a range of foreseeable changes in conditions that can be allowed without renegotiation. Evidence of renegotiations in France suggests that subject to some contract caveats, renegotiations between the contract parties aim to improve outcomes for both parties to the contract through the cooperation of both partners.

Furthermore, the Canadian experiences of PPP projects do not reveal precisely the initiators of PPP renegotiations as data on renegotiation are scarce. Though, change negotiations in PPP projects were established to be within the initiative of both the public client and the PPP private company (Vining and Boardman, 2008). Summarily, the SPV record the highest number of renegotiations in comparison to the government corroborates the findings of academic studies on PPP renegotiation (Xiong and Zhang, 2014; Cruz and Marques, 2013b). Though, regional experiences differ considerably from one another. The number of renegotiations initiative in each of the PPP infrastructure projects shown in Table 3.1 indicates that all the renegotiation initiatives of the private partner are in road projects, which account for the highest number of initiatives in the transportation sector. These suggest that most renegotiation requests in PPP road projects are at the instance of the SPV or the private sector company. The incessant renegotiation request by the SPV during the renegotiation of the PPP road project, therefore, supports the evidence provided by the literature and substantiates the findings of Table 3.1.

3.5 RENEGOTIATION OBJECTIVES OF THE STAKEHOLDERS

Public and private parties are the main parties in the execution of a PPP project, who share responsibilities and play roles at strategic phases of the implementation of PPP projects including renegotiation responsibilities. Government/regulator, the users, private operators and sponsors or financiers are the stakeholders in a PPP arrangement (Nikolaidis et al., 2013). These groups have a differing interest in PPP projects, and only two can individually initiate the renegotiation process in PPP projects. These stakeholders to the PPP projects have their respective interest or objectives to protect, which in most instances differ considerably from the individual goals.

Sarmento (2014b) and Mackintosh (1992) identify that the interests of the private and public partners differ significantly from each other, which justifies the need for a synergy between the differing interests. Synergy is necessary to enhance additional benefits and even distribution of the benefits among the project's stakeholders, particularly the public and private partners (Mackintosh, 1992). The synergy of interest based on individual objectives of the public and private partners are shown in Figure 3.1.

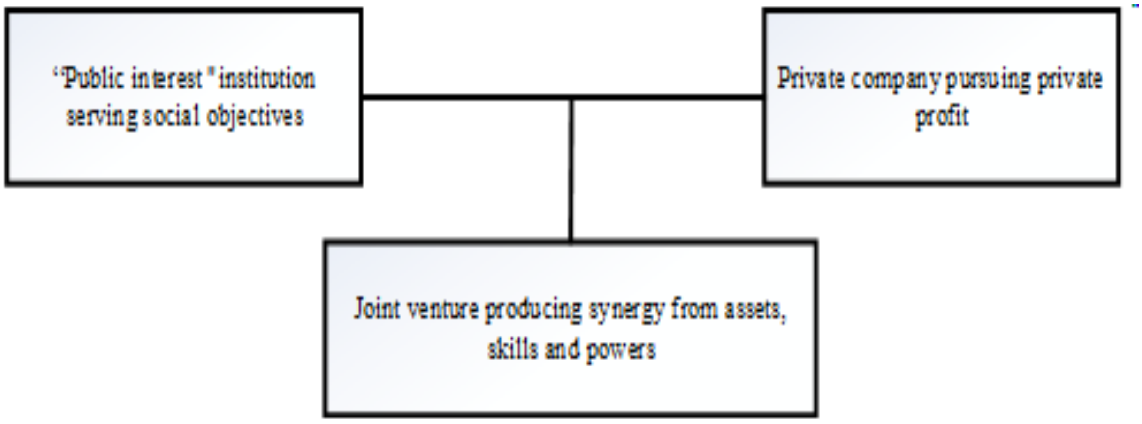


Figure 3.1: Synergy of Interest in PPP

Source: Mackintosh (1992)

The interests of the partners as identified in Figure 3.1 are the objectives of the parties to the PPP contract. For example, the government agency representing the government has the sole purpose of achieving VfM for members of the public, i.e., the creation of social benefits and infrastructure in the most economic terms (Henjewele et al., 2011; HM Treasury, 2007). However, this objective is opposite to the purpose of the private company in a PPP contract, which is to maximise the profits of the investments or risks. Thus, the defined objectives remain the focal points for both stakeholders in PPP infrastructure project development and represent the motive behind opportunism in PPP projects (McErlane et al., 2016). These are based on the widely held assumption that the parties to PPP contractual agreement usually seek to achieve, or if possible surpass, their respective objectives or targets that are set from project inception.

Therefore, for the success of any renegotiation process in PPP projects, there is the need for a private partner and public partner joint venture, which is premised on mutual understanding and cooperation to ensure the achievement of stakeholders' objectives at every stage of the PPP project implementation. In addition to the aims of the main parties in a PPP contract renegotiation, other stakeholders have their respective goals usually defined at inception prior to the commencement of the PPP. For instance, the lenders or financial institutions require the investment or the loan to yield the best possible interest based on the prevailing rates in the economy.

3.6 PROCESS OF RENEGOTIATIONS

The procurement process of contractual infrastructure projects starts with the inception and planning of the contracts, which usually represent the start of the contract. The client defines the method of procurement to adopt at the beginning of the contract during the planning stage amongst others, which include the modalities for the execution of the contract. However, literature findings reveal that the implementation phases of a contract vary from one category of the project to another and the method of procurement adopted in the specific instance. Ahadzi and Bowles (2004) indicate that the four main stages of PPP projects are the feasibility and planning phase, the bidding and negotiation phase, the construction and operation phase. These four stages, according to the literature represent critical phases identified in the initiation and planning phase, procurement phase and partnership phase, which have been internationally recognised as the respective categories of PPP project stages (Liu et al., 2014). The bidding and negotiation phase identified by Ahadzi and Bowles (2004) fall within the procurement phase, which is indicated by Liu et al. (2014) as one of the three main aspects of PPP project development. Though, there are sub stages under each of the phases identified in the literature. After the completion of all these three main phases, there is the transfer of the facility to the public partner. However, the renegotiation phase is not included as this could occur at any of the four stages of the PPP (Salacuse, 2000). Hence, this implies that there is a place for contract renegotiation during PPP at the respective phases of the project implementation.

The renegotiation process involves bargaining between the contracting parties with the aim of reaching a mutually satisfying agreement (Nikolaidis et al., 2013). Further studies support this by stating that renegotiation of PPP contracts is procedural and follows prescribed steps, which involve collectively making decisions (Acerete et al., 2010; Sarmento, 2010; Guasch et al., 2007b). These suggest that for the successful renegotiation of PPP contracts, the process should follow the necessary procedure or form. Thus, the submissions of these authors suggest that renegotiation entails deciding on the most effective and efficient course of action from a list of options or alternatives.

In PPP projects, however, the process of renegotiation is usually defined from the inception of the contract (Sarmento, 2014). The formation of the renegotiation process is stipulated in the contract renegotiation clauses assigned to the process of renegotiation (Beckers et al., 2010). There is also the definition of the variation procedures, dispute resolution mechanisms, and termination clause at the inception of the contract.

Moreover, the description of the method to calculate the changes or variations required to the contract to establish or ascertain appropriate compensation is necessary for the renegotiation process. Failure of the parties to agree at the modification procedure stage may necessitate the invocation of the dispute resolution mechanisms (Beckers et al., 2010).

Although renegotiation has been acknowledged to follow a process, the process is not static and could differ from one PPP project to another and from country to country (Sarmento, 2014). Cruz and Marques (2013a p. 355) corroborate this by stating as follows: *"the renegotiation development process differs significantly from country to country and among different sectors."* Notable among the processes of renegotiation is the General Concession Renegotiation Framework (GCRF) presented by the literature (Xiong and Zhang, 2014), which diagrammatically shows that the renegotiation process follows a path and flows sequentially from one stage to another (See Appendix 6). The framework indicates that the formation of a contract between the parties, i.e., public and private entities begins the contractual relationship. However, events may occur after the formation of the contract leading to new developments and require an action or decision to be taken. These events or developments, according to Xiong and Zhang (2014), may bring about the decision to renegotiate the contract or to go ahead with the provisions of the contract.

Also, if the primary stakeholder's decision favours renegotiation, then specific outcomes are expected within the renegotiation process, which could include the need to enforce the initial contract in the event the renegotiation succeeds, and the agreement is upheld or amended. There could be outright abandonment or closure of the contract in the event of failure of the renegotiation to achieve the objectives expected by one or both primary renegotiation stakeholders. Beckers et al., (2010) explains the formation of the renegotiation process by identifying three renegotiation clauses, which could be assigned to the process of renegotiation as follows: variation procedures; dispute resolution mechanisms; and termination clauses. First, there should be the definition of the variation procedures for the determination of an appropriate compensation, including both process and calculation rules. Second, the study proposed that if the parties to the PPP contract are not able to reach an agreement in the variation procedure, dispute resolution mechanisms could emerge. The third and ultimate means in the renegotiation process is that the project can be cancelled using termination procedures, which could consist of the renegotiation process as well as calculation rules (See Appendix 8).

3.7 COMPENSATION MEASURES IN CONCESSION CONTRACT RENEGOTIATION

Previous studies on PPP renegotiation have established that renegotiation occurs because of events external or internal to the projects, which necessitate a change in project scope, terms or conditions (Hasselgren et al., 2014; Sarmento, 2014). A severe risk scenario in PPP projects resulting in the deviation or unfavourable outcome to both or either parties may warrant compensation (Xiong and Zhang, 2014). Thus, the need to provide for necessary compensation measures in the partnership agreement for adoption during PPP project implementation has been identified by previous studies (Xiong and Zhang, 2014). The process and procedure of awarding compensation to contracting parties at renegotiation are illustrated in the General Concession Renegotiation Framework (GCRF), which typically indicate the point of opening renegotiation within a concession contract and the respective compensation measures available (See Appendix 7).

The exposure of the PPP contract to a severe risk scenario may give rise to a problem that could warrant a check on the project performance indicators at the project implementation stages. If the risk scenario results in non-achievement of the project performance indicators, i.e., the minimum traffic, minimum revenue, shareholders' and internal rate of return among others, then the project can be renegotiated. The renegotiation process could give rise to compensation measures: toll increase, contract extension, direct government reimbursement and other measures. Moreover, conflicting interests during the implementation phase of PPP projects could also result in contract renegotiation. Nikolaidis et al. (2013) attest to this by stating that problems may arise between the parties during the negotiation process because of a conflict of interests over a set of available alternatives, which could result in contract renegotiation, thereby necessitating procedural adoption of a defined process during the implementation stages. This process usually follows prescribe form in the contract agreement.

3.8 EXPERIENCE OF PUBLIC PRIVATE PARTNERSHIP IN TRANSPORT PROJECTS

There are varying experiences across the world regarding the participation of countries in the use of PPP for infrastructure projects delivery. Evidence available from large international bodies such as World Bank and European Investment Bank reveals the statistics of several countries regarding PPP participation across the respective infrastructure sectors (PPI Database, 2016;

Bain, 2009). The investment commitments of various regions in the delivery of infrastructure projects across countries particularly in developing countries are shown in Table 3.2.

Table 3.2: Regional Experiences of the Transport Sector Projects Modes

S/N	Snapshots or Details	Transport Modes Highlights (1990-2016)			
		Airports	**Railways**	**Roads**	**Seaports**
1	No of countries with private participation	144	101	233	255
2	Projects reaching financial closure	181	128	981	448
3	Region with largest investment share	SSA (1735%)	SSA (1969%)	SSA (1714%)	SSA (1588%)
4	Type of PPI with largest share in investment	Management& lease contract (1879%)	Management& lease contract (2073%)	Greenfield (1912%)	Greenfield (1874%)
5	Type of PPI with largest share in projects	Management& lease contract (1506%)	Management lease contract (1903%)	Greenfield (1789%)	Greenfield (1605%)
6	Projects cancelled or under distress	15 (134% of total investment)	19 (366% of total investment)	74 (268% of total investment)	12 (56% of total investment)
		Projects Reaching Financial Closure (By Sector)			
	Region	**Airports**	**Railways**	**Roads**	**Ports**
1	East Asia and Pacific (EAP)	32	33	218	123
2	Europe and Central Asia (ECA)	34	8	12	32
3	Latin America and the Caribbean (LAC)	78	63	334	164
4	Middle East and North Africa (MENA)	12	2	-	22
5	South Asia (SA)	10	9	403	51
6	Sub- Saharan Africa (SSA)	15	21	14	56
	Total Regional Projects Reaching Financial Close	**181**	**136**	**981**	**448**
		Investment in projects by region (US$ million)			
	Region	**Airports (US $M)**	**Railways (US $M)**	**Roads (US $M)**	**Ports (US $M)**
1	East Asia and Pacific (EAP)	5,832	34,409	48,135	21,705
2	Europe and Central Asia (ECA)	48,988	5,356	23,295	4,351
3	Latin America and the Caribbean (LAC)	39,549	55,295	127,407	26,418
4	Middle East and North Africa (MENA)	2,007	343	-	5,103
5	South Asia (SA)	5,629	7,905	75,785	11,999
6	Sub- Saharan Africa (SSA)	1,674	5,119	3,057	11,833
	Total Investment in Projects by Sector	**103,679**	**108,427**	**277,679**	**81,409**

Source: PPI Database (2016)

Based on the highlights of the respective regions shown in Table 3.2, Latin America countries have the highest private participation in PPP and the largest number of projects reaching financial closure. The region also has the largest investment share, the most significant share in the project and a tremendous record of cancelled or distressed projects in comparison with other parts of the world (PPI Database, 2016). The investment levels, project values and the characteristics of private participation in infrastructure delivery across the regions indicate that road projects account for the highest level of investments across countries, particularly in Latin America

countries. The most significant numbers of new projects were in electricity, followed by telecommunication and transport sectors respectively.

Furthermore, the record of cancelled or distressed projects is also higher in the road projects in Latin America (PPI Database, 2016). Latin America attracted investments within the last ten years that far outweighs the percentages of the remaining regions of the world with a robust 64% of total global investments (PPI Database, 2014). These findings make it imperative and pertinent to evaluate and assess PPP road projects of other regions because of the experience of Latin American in PPP road projects.

The renegotiation experience of PPP projects also flows in conformity with the general skills of countries regarding infrastructure projects delivery. Previous theoretical and empirical studies investigated PPP contract renegotiation (Sarmento and Renneboog, 2016; Reside and Mendoza, 2010; Guasch et al., 2014; Sarmento, 2014; Acerete et al., 2010; Baeza and Vassallo, 2010; Estache et al., 2009; Acerete et al., 2009). These studies reveal data on the renegotiation of PPP infrastructure projects with reference to road projects within the last two decades in Latin America and other countries such as Portugal and Spain. In Latin America, for instance, there is evidence that renegotiation in the transport sector usually occurs after three years of signing the contract especially after competitive bidding (Guasch et al., 2004).

Hasselgren et al. (2014), however, claim few data on PPP renegotiations in the UK. The reason for this experience in the UK may be related to the experience in Portugal where the literature established that private companies do not usually provide information on contract agreements and are unlikely to reveal information regarding renegotiation decisions and outcomes (Sarmento, 2014). Based on the attendant challenges of little renegotiation research in the UK, there is a need for empirically guided study to address the gaps in knowledge on road projects delivery. In addition, most renegotiation studies evaluate incidences of renegotiation in developing countries (Guasch et al., 2014; Guasch and Straub, 2006). Renegotiations of PPP infrastructure projects also occur in some developed nations (Nikolaidis and Roumboutsos, 2013; De Brux et al., 2011) in varying and differential degrees. However, the subsisting issue based on the renegotiation experiences of few developed and developing countries is the non-achievement of VfM at renegotiation (Cruz et al., 2015; Guasch et al., 2014; Nikolaidis and Roumboutsos, 2013).

The literature provides detail evaluation and assessment of the issues and outcomes of the renegotiation of PPP road projects concerning the experiences of countries through theoretical and empirical studies (Gifford et al., 2014; Bi and Wang, 2011). The highlight at the end of the literature review reveals that the renegotiation outcomes across the countries identified are due to one or more of the factors identified and explained in the succeeding section of this thesis. Thus, the renegotiation incidences across selected regions and countries are in Table 3.3.

Table 3.3: Incidences of Renegotiations of PPP in Selected Regions of the World

Region	Sector	% of renegotiated contracts	Source
Latin American and Caribbean	Total	68%	Guasch et al. (2014)
	Electricity	41%	
	Transport	78%	
	Water	92%	
India	All sectors	0%	Guasch et al. (2014)
US	Highways	40%	Engel et al. (2011)
France	Highways	50%	Athias and Saussier (2007)
	Parking	73%	Beuve et al. (2013)
UK (Scotland)	All Sectors	22%	NAO (2003)
	All sectors	51%	CEPA ((2005)

Source: Hasselgren et al. (2014)

3.9 FACTORS LEADING TO RENEGOTIATION IN PPP ROAD PROJECTS

This section discusses the findings of the literature regarding the factors leading to the renegotiation of PPP road projects. The discussion is by a systematic review carried out with 22 kinds of research within the last ten years. The factors grouped into 11 categories based on the contract implementation stages. The reason for this categorisation along the dimension of the phase of implementation is because the stakeholders in most instances have the right to request renegotiation during the implementation stages. Moreover, the factors leading to the PPP road projects renegotiation indicated in the literature were observed to fall in the respective categories of design, technical, economic, contractual and administrative, tendering and bidding, regulatory and legal, environmental amongst others. There is the discussion of the findings of the literature regarding the factors leading to the renegotiation of PPP road projects.

A comprehensive search of the literature, which includes journals, conference proceedings, working papers, newsletters, workshop booklets, seminar papers, internet documents and other available sources of information on factors leading to PPP road projects renegotiation are identified. However, only journal and conference papers, which are relevant and applicable to PPP road projects, are selected from the downloaded materials. The findings from each of the literature were used to group the factors into the respective categories. The numerous factors are cross-examined through the analysis of the content of each of the research to ascertain their criticalities and were rank based on their frequencies of occurrence as shown in Table 3.4. The thorough and adequate critique of the identified kinds of literature is in Table 3.4.

Table 3.4: Factors Leading to Renegotiation

S/N	Factors	Literature Sources																								
		Cruz et al. (2015)	Guasch et al. (2014)	Dominques & Zlatkovic (2015)	Bitran et al. (2013)	Cruz & Marques (2013a)	Menezes and Ryan (2015a)	Bi & Wang (2011)	Montecino and Saavedra (2014)	Baeza & Vassallo (2010)	De Brx (2010)	Reside & Mendoza (2010)	Chaan et al. (2010)	Saussier et al. (2009)	Athias & Nunez (2008)	Estache et al. (2008b)	Guasch et al. (2007b)	Engel et al. (2009)	Guasch & Straub (2009a)	Guasch et al. (2004)	Esatache et al. (2003)	Guasch et al. (2003)	Sarmento (2014)	Number of Citations	Total Citations
A	**Design and Planning factors**																								
1	Inaccurate estimation of traffic level	v	v	v					v	v														5	24
2	Misallocation of traffic risk		v	v					v	v												v		5	
3	Poorly written contract (ambiguity)		v	v							v									v				4	
4	Change in concession design scope					v																	v	2	
5	Unilateral changes of design concept during execution	v				v																		2	
6	Inaccurate estimation of capital cost									v														1	
7	Defective contract award criteria or incorrect assumptions in the contract											v								v	v		v	4	
8	Characteristics of the contract															v								1	
B	**Technical factors**																								
9	Specification changes during technical development		v		v	v																	v	4	7
10	Variations or additional works																						v	1	
11	Efficiency or standard of technical skills and expertise											v												1	
12	Delays during the construct stage of the project																						v	1	

Table 3.4: Factors Leading to Renegotiation (Contd.)

S/N	Factors	Literature Sources																							
		Cruz et al. (2015)	Guasch et al. (2014)	Dominques & Zlatkovic (2015)	Bitran et al. (2013)	Cruz & Marques (2013a)	Menezes and Ryan (2015a)	Bi & Wang (2011)	Montecino and Saavedra (2014)	Baeza & Vassallo (2010)	De Brx (2010)	Reside & Mendoza (2010)	Chaan et al. (2010)	Saussier et al. (2009)	Athias & Nunez (2008)	Estache et al. (2008b)	Guasch et al. (2007b)	Engel et al. (2009)	Guasch & Straub (2009a)	Guasch et al. (2004)	Esatache et al. (2003)	Guasch et al. (2003)	Sarmento (2014)	Number of Citations	Total Citations
C	**Economic Factors**																								
13	External or macro-economic shock				v			v				v				v						v		5	**15**
14	Changes in economic policy		v						v						v					v				4	
15	Changes in general price level		v			v																		2	
16	Change in demand		v				v																	2	
17	Weak economic environment											v											v	2	
D	**Contractual Factors**																								
18	Effectiveness and efficiency of contract enforcement										v				v					v	v		v	5	**11**
19	Contract delay occasioned by expropriations	v				v																	v	3	
20	Incomplete contract		v	v																				2	
21	Use of multidimensional auctions													v										1	
E	**Tendering and Bidding Factors**																								
22	Poor evaluation of aggressive bid		v				v	v					v		v								v	6	**14**
23	Anticipation of renegotiation at contract formative stage				v						v				v			v						4	

Table 3.4: Factors Leading to Renegotiation (Contd.)

S/N	Factors	Literature Sources																								
		Cruz et al. (2015)	Guasch et al. (2014)	Dominques & Zlatkovic (2015)	Bitran et al. (2013)	Cruz & Marques (2013a)	Menezes and Ryan (2015a)	Bi & Wang (2011)	Montecino and Saavedra (2014)	Baeza & Vassallo (2010)	De Brx (2010)	Reside & Mendoza (2010)	Chaan et al. (2010)	Saussier et al. (2009)	Athias & Nunez (2008)	Estache et al. (2008b)	Guasch et al. (2007b)	Engel et al. (2009)	Guasch & Straub (2009a)	Guasch et al. (2004)	Esatache et al. (2003)	Guasch et al. (2003)	Sarmento (2014)	Number of Citations	Total Citations
24	Opportunistic bidding		v					v			v													3	
25	Bidding error during procurement		v																					1	
F	**Administrative and Managerial Factors**																								
26	Corruption at the project level (e.g. financial abuse)		v																					1	
27	Non-commitment to contract clause		v																					1	
28	Administrative delays																						v	1	**5**
29	Transparency in the discharge of managerial duties		v																					1	
30	Inadequate contract management expertise															v								1	
G	**Institutional factors**																								
31	Misaligned/weak institutions & jurisdiction of decisions		v	v																				2	**2**
H	**Regulatory & legal factors**																								
32	Availability of regulatory institutes																	v	v					2	
33	Poor or inadequate of regulatory account		v	v				v	v										v		v		v	7	**24**
34	Type of tariff regulation								v		v	v							v		v	v		6	

Table 3.4: Factors Leading to Renegotiation (Contd.)

S/N	Factors	Literature Sources																							
		Cruz et al. (2015)	Guasch et al. (2014)	Dominques & Zlatkovic (2015)	Bitran et al. (2013)	Cruz & Marques (2013a)	Menezes and Ryan (2015a)	Bi & Wang (2011)	Montecino and Saavedra (2014)	Baeza & Vassallo (2010)	De Brx (2010)	Reside & Mendoza (2010)	Chaan et al. (2010)	Saussier et al. (2009)	Athias & Nunez (2008)	Estache et al. (2008b)	Guasch et al. (2007b)	Engel et al. (2009)	Guasch & Straub (2009a)	Guasch et al. (2004)	Esatache et al. (2003)	Guasch et al. (2003)	Sarmento (2014)	Number of Citations	Total Citations
35	Governance and regulatory effectiveness											v				v			v	v			v	5	
36	Specific legal changes																						v	1	
37	Weak legal environment																						v	1	
38	High or ncremental changes to corporate tax and levies.																						v	1	
39	Changes to PPP legal or general procurement framework					v																		1	
I	**Political Factors**																								
40	Political instability (e.g. change in govt. or govt. priorities)		v		v							v								v		v	v	6	**18**
41	Political opportunism		v															v		v				3	
42	Corruption at governance (e.g. misappropriation of funds)		v															v	v					3	
43	Awarding concessions shortly before or after elections		v								v												v	3	
44	Favouritism of SPV based on nationality and affiliation																			v	v			2	
45	Inordinate ambition to meet or surpass electoral agenda									v														1	

Table 3.4: Factors Leading to Renegotiation (Contd.)

S/N	Factors	Literature Sources																							
		Cruz et al. (2015)	**Guasch et al. (2014)**	**Dominques & Zlatkovic (2015)**	**Bitran et al. (2013)**	**Cruz & Marques (2013a)**	**Menezes and Ryan (2015a)**	**Bi & Wang (2011)**	**Montecino and Saavedra (2014)**	**Baeza & Vassallo (2010)**	**De Brx (2010)**	**Reside & Mendoza (2010)**	**Chaan et al. (2010)**	**Saussier et al. (2009)**	**Athias & Nunez (2008)**	**Estache et al. (2008b)**	**Guasch et al. (2007b)**	**Engel et al. (2009)**	**Guasch & Straub (2009a)**	**Guasch et al. (2004)**	**Esatache et al. (2003)**	**Guasch et al. (2003)**	**Sarmento (2014)**	**Number of Citations**	**Total Citations**
J	**Environmental Factors**																								
46	Changes in design due to environmental problems	v					v																	2	6
47	Poor or erroneous environmental impact assessment			v		v																		2	
48	Unforeseen events & challenges (e.g. earthquake, erosion)						v																	1	
49	Archaeological findings																						v	1	
K	**Social Factors**																								
50	Social acceptability of projects characteristics			v																				1	3
51	Social acceptability of user charges or fees																v							1	
52	Cultural dimensions and willingness																v							1	
	Total Number of Citation from Author	**4**	**20**	**7**	**4**	**7**	**4**	**4**	**5**	**4**	**6**	**7**	**1**	**1**	**4**	**4**	**2**	**4**	**5**	**8**	**5**	**4**	**18**		

The factors leading to renegotiation as indicated in Table 3.4 may also be the reasons why the primary stakeholders involved in the procurement of PPP infrastructure projects usually renegotiate the contract (Guasch et al., 2014). Some justifications are genuine, and the others are not genuine. Also, certain circumstances may necessitate the renegotiation of PPP road projects. Each of the categories is enumerated as follows:

3.9.1 Design and Planning Factors

There are factors, which emerge at the preliminary stage of the PPP contract, which drives or influences renegotiation. Several studies identified these factors as design factors with their driving effects observed at the design stage of the PPP procurement process. As indicated in Table 3.4, the factors include inaccurate estimation of traffic level; misallocation of traffic risk; poorly written contract or ambiguity in the contract; change in concession design scope; unilateral changes of design concept during execution; inaccurate estimation of capital cost at the planning stage. First, there may be an error in the evaluation of the traffic expected to use the road network, which may either reflect in either underestimation or overestimation of traffic level and consequently affect the actual revenue in comparison with the anticipated revenue (Domingues and Zlatkovic, 2015; Baeza and Vassallo, 2010). Also, the risk inherent in the future traffic level that may not be allocated equitably in the contract at the inception (Montecino and Saavedra, 2014). The agreement may, therefore, be renegotiated during the implementation at the operational stage due to the variance in the revenue because of the inaccurate estimation of traffic levels. The intention of PPP operators or private companies in this instance is to renegotiate the contract because of the possible financial imbalance occasioned by the changes in revenue because of the shift in traffic level.

An incorrect assumption in the agreement is one of the contractual basis of the PPP road projects renegotiation (Reside and Mendoza, 2010; Guasch and Straub, 2009a). The risk-sharing ratio or matrix, the responsibilities of the parties under the contract, the contractual specifications and clauses are among the assumptions usually included in the contract agreement and constitute the basis for the formation of the deal. Errors, over or underestimation of any of the identified assumptions may necessitate renegotiation of the PPP road contract during the implementation of the project. Estache et al. (2008) identified the characteristics of the contract as a possible contractual factor leading to renegotiation. The attributes under consideration here could include contract duration (e.g., contractual agreement concerning the concession period), specification concerning quality and quantity of materials and quality of workers, the contractual parties' main and subsidiary objectives, etc.

Guasch et al. (2014) corroborate this submission by identifying poorly written contracts as one of the drivers of renegotiations occasioned by the error of the planners and designers of the concession contracts. The design error at the planning stage usually necessitates the review of the agreement during the implementation (De Brux, 2010). Other PPP road project renegotiations studies identify the error in the criterion for contract award established by the designers and planners of the PPP projects, which include the length of the concession contracts, material and equipment standards amongst others (Domingues and Zlatkovic, 2015; Guasch et al., 2004). Moreover, changes introduced at both the design and construction stages of the contract may hurt the contract deliverables. The changes could be regarding concession design scope and unilateral modifications of design concept during project execution, which may lead the stakeholders to renegotiate the terms of the contract. Also, the estimation of the capital cost of the project at the planning stage of the contract by the quantity surveyor or estimator may not take into consideration all the cost requirements at the design and planning stage. As a result, there may be the need for contract renegotiation to adjust the financial conditions and rebalance the PPP road project economic structure towards achieving an acceptable contract sum to the stakeholders especially the client.

3.9.2 Technical Factors

The factors leading to renegotiation of PPP road projects are also attributable to the construction stage, i.e., technical stage of PPP road projects procurement. Poor management of workforce, machinery and equipment, materials and money at the construction stage of PPP road projects are technical issues constituting factors leading to renegotiation of contracts at the construction stage (Cruz et al., 2015). Guasch et al. (2014) support these by identifying poor contract management, which includes the construction phase as one of the possible drivers of PPP road projects renegotiation. The poor management of the construction resources may be because of the attendant impact on the project deliverables regarding time, cost and quality as stipulated in the contract. For instance, an increase in contract cost, concession duration and poor quality during implementation may be unsatisfactory to the client and may lead to a renegotiation request by either the client or the private partner. Hence, the client usually makes unilateral changes to the terms of the agreement at the construction stage at this point to meet the interest of the public sector (Cruz et al., 2015; Cruz and Marques, 2013b).

Other studies have identified among other things changes to the extent or scope of work and inclusion of additional or complementary jobs (Bitran et al., 2013). These changes could be because of several reasons, which may be the changing taste and fashion of the governments, changes in materials cost and other variations in the prevailing market condition. All the identified outcomes are evidence that PPP road projects have experienced some level of cost overruns

particularly at the construction stage of PPP road projects implementation in both Latin America and Portugal could necessitate the revision or amendment of the agreed contract sum. (Guasch et al., 2014; Sarmento, 2014). Besides, road concession contract in Spain and some Latin America countries provided sufficient evidence regarding time overruns in PPP road projects because of the extension of concession contract (Guasch et al., 2014; Baeza and Vassallo, 2010).

3.9.3 Economic Factors

There could be changes in economic circumstances of a country that significantly result to contract renegotiation, e.g., fluctuations, devaluation of currencies and exchange rates of regulated markets, which can drive renegotiation of PPP projects (Dethier and Moore, 2012; Gifford et al., 2014; Burger et al., 2009). The influence of the changes is evident, especially when no prices of materials and other inputs required can be adjusted (Dethier and Moore, 2012; Gifford et al., 2014; Burger et al., 2009). Furthermore, existing literature on renegotiation corroborates this submission by stating the reasons attributed to the influence of economic conditions on the need for renegotiation of PPP projects. One of these reasons is the occasional unexpected change in the economy due to external and economic factors, e.g., change in economic regulation by the government concerning financial policies (Guasch et al., 2014; Montecinos and Saavedra, 2014; Athias and Nunez, 2008). Renegotiation of PPP projects, especially in the transport sector could, therefore, occur because of one or more of these changes.

The literature has also identified abuse of financial equilibrium principle stated in the contract as one of the possible causes of renegotiation in PPP road projects (Cruz and Marques, 2013b). The fiscal budget needs adherence, and any deviation from the budget defined at inception could be regarded as an abuse and hence necessitate the renegotiation of the contract. A renegotiation could also occur because of the changing price of goods and services required during the implementation process because of the changing price level of materials, labour, and equipment, which are used during the production process of PPP road projects (Guasch et al., 2014; Cruz and Marques, 2013b).

A change in demand for the products of PPP transactions is another drive of renegotiation in PPP projects (Guasch et al., 2014). The event could also arise during the PPP project implementation where the source of finance for the PPP projects will cease, and there will be the need to assess another financial institution or banks to secure other means of funding (Guasch et al., 2004). In this situation, the initial contract ends abruptly and requires a new agreement based on original terms of the deal. Last but not the least is the influence of macroeconomic shock on PPP road project renegotiation (Guasch et al., 2008b; Guasch et al., 2003). In the event of a macroeconomic shock, the economies of affected countries tend to be more volatile with some associated economic crises that are deeper and more prolonged than the experience of nations having

advanced economies (Green et al., 2001). The impact of macroeconomic shock to the economy of countries can be recession and inflation leading to increasing poverty level and low acquisition potential for infrastructure services by the government.

3.9.4 Contractual Factors

The influence of delay can be evident at the formation of the contract and during the implementation of the provisions of the agreement, especially before the commencement of the stages of work cannot be overemphasised. Delays in expropriations of PPP projects are one of the types of delay, which could result to PPP road projects renegotiation as established by the literature (Cruz et al., 2015; Cruz and Marques, 2013b; Sarmento, 2014). The delays experienced can cause renegotiation problems, which could affect the variables of cost and time negatively. An unaddressed delay could result in contractual incompleteness and lead to renegotiation of PPP road projects.

Other PPP road project renegotiations studies identify contract delay occasioned by expropriations, i.e., a situation where the public agency takes private property for a purpose deemed to be in the public interest (Cruz et al., 2015; Cruz and Marques, 2013a). Incomplete agreement at the contract formulation stage before the start of the project implementation could also result to renegotiation of such contract during the stages of execution (Domingues and Zlatkovic, 2015; Guasch et al., 2014). Conclusively, the use of multidimensional auctions during the tendering phase may introduce complexity into the criterion for contract award established by the designers and planners of the PPP projects, which may unnecessary extend the length of the concession contracts amongst others.

3.9.5 Tendering and Bidding Factors

Operators or private concessionaire due to the competitiveness of the bidding process, which usually characterises PPP procurement are prone to the submission of aggressive bidding to win the contract (Menezes and Ryan, 2015b; Bi and Wang, 2011; Montecinos and Saavedra, 2014; Guasch and Straub, 2009b). The aggressiveness in the submission of the bid is because of the concessionaire's seizure of the opportunity to inflate the contract sum (Chan and Levitt, 2009). Therefore, the intention of the PPP operators or private companies may be to renegotiate the contract during the implementation of the projects because of the possible financial imbalance, which may arise because of the aggressive bid submitted. Hence, PPP contract may be renegotiated because of the willingness and anticipation of contract renegotiation from the onset, which may be evidence in lowballing or capital cost underestimation and aggressive bidding (Bitran et al., 2013; Menezes and Ryan, 2015b; Engel et al., 2009). Nikolaidis et al. (2013) corroborate that renegotiation may be influenced by aggressive bidding during PPP

implementation particularly when there are an intention and willingness of the by the public party to renegotiate the contract in the future.

Other factors, which may lead to renegotiation of PPP road projects include issues related to unforeseen events, assignment of cause causation & poorly treated compensation levels in the contract (Guasch et al., 2014). Inefficient or low percentage of land allocated to the operator from inception (Montecinos and Saavedra, 2014). Securing additional investments or projects without going through due diligence (Cruz et al., 2015). However, these are limited and may encompass more than the identified factors. The factors leading to the renegotiation of DBFO road projects are also the reasons for renegotiation. These answer the question "why renegotiate." The conditions in some instances may be the reason for renegotiation of PPP projects and in other situation may not be the reasons. Therefore, the primary stakeholders do renegotiate the contract in PPP projects because of several motives (Sarmento, 2014). These motives are on the premise of specific factors, which drive renegotiations. These factors may also be the reasons why the stakeholders may want to renegotiate a concession contract.

Grounds for renegotiation may be related to the driving factors. However, what drives the stakeholders may not necessarily be the motive behind seeking renegotiation as renegotiation may be requested to align the contract to the specified terms while at the same time trying self-interest with guile (Mackintosh, 1992). Therefore, what drives renegotiation may be the reason and motive for renegotiating a contract and at some other point or situation, it may not. Thus, the literature provides evidence of the possible causes for the renegotiation of PPP projects, particularly within the road sector (Estache et al., 2009, Estache et al., 2008).

Ho and Tsui (2009) corroborate these through a clear diagrammatic presentation of the framework for PPP interaction dynamics, which shows the respective process of renegotiation as shown in Appendix. According to the framework context, transaction sources can affect the objectives of the primary stakeholders because of the interaction dynamics of the cost sources. The respective transaction costs sources can impact the individual goals of the partners. The effect of the impact could reflect the level of social gains to the governments, users and the profitability of the concession to the private sector (Ho and Tsui, 2009; Trebilcock and Rosenstock, 2015).

The reasons for renegotiation are classified into four categories namely: underbidding at bidding stage, opportunistic behaviour, over-demand, unexpected project changes (Cruz et al., 2015; Guasch et al., 2014; Bi and Wang, 2011). The economic, environmental, political amongst others are the categories of changes which could impact the project outcomes. Private sector players have argued that unforeseen changes in the environment had resulted in making projects commercially unviable (Guasch et al., 2004). Other reasons leading to renegotiations are based on anecdotal evidence like faulty contract designs, failure on the part of the government to honour

contract clauses, weak regulation and its effects (Domingues and Zlatkovic, 2015; Guasch et al., 2014; Guasch et al., 2007). Conclusively, opportunism by the private partner tends to increase the tariffs and fees charged to the user, which can, in turn, erode the VfM of the project. There are also instances that can arise in situations where governments through bilateral renegotiation to gain undue advantage in favour of the private company to the detriment of the users and for the political gains of a government representative.

Therefore, both the private operator and the government use renegotiations as means of unlawful appropriation (Sarmento, 2014). Though opportunism is observed in the private sector, it also manifests within the circle of public sector clients in the form of an increase in infrastructure spending in the bid to create social services towards the welfare of the members of the public. However, the expenditure is misused towards the political gains of public office holders (Engel et al., 2006). According to Engel et al. (2006), the inappropriate spending is to increase the government's prospect of winning future elections, especially during electioneering period or campaigns. Furthermore, there is evidence that states also use renegotiations as means of budget evasion to ensure an increase in expenditure on the infrastructure project. However, the government and regulators contested these actions because of the impact it has on value for money, the protection of public welfare, profit-seeking, claimed inefficiency and mismanagement of projects by the private partner (Sarmento 2014). Therefore, opportunistic behaviours are not prevalent in the private-sector partner circle alone, but it can also manifest within the procuring authority establishment and as such leads to the PPP renegotiations in the road sector.

3.9.6 Administrative and Managerial Factors

Recent kinds of literature acknowledge that corruption, which manifests in various forms during the management and administration of PPP projects across infrastructure sectors can significantly determine the renegotiation level of PPP road projects renegotiation. (Guasch and Straub, 2009a; Guasch and Straub, 2009b). The level of corruption at the country governance level can, therefore, be an indicator of the degree of renegotiation in that country PPP implementation process. Contrastingly, few renegotiations have characterised renegotiation in a less corruption-prone environment. The corruption experienced in PPP procurement is committed by human factors, some of which have been identified to be stakeholders of the PPP infrastructure projects. Therefore, perceived corrupt opportunities, which the primary stakeholders seek during the PPP projects implementation is one of the prominent influencing factors of contract renegotiation (Guasch and Straub, 2009a; Guasch and Straub, 2009b). Corruption manifests in several dimensions within the PPP procurement environment at the respective stages of implementation.

Opportunism usually manifest in the private partner's opportunistic behaviour, and it is exhibited at the implementation stages of PPP infrastructure projects (Boardman and Vining, 2012; Bi and Wang, 2011; Zheng et. Al., 2008). Public sector clients can also use renegotiation advantage as an opportunity to avoid the due process of competitive bidding through the available opening, which permits application for additional finance and parliament authorisation (Engel et al., 2009). The private concessionaire could also exhibit opportunism at the bidding stage through lowballing and intentional under-bidding to win the contract (Capaccio, 2017; Engel et al., 2014a). The reason for under-bidding is usually on the expectation of renegotiating the terms of the agreement later in the future.

Collusion also tends to increase the contract sum in a situation where the bidders connive and agree to inflate the project bid submitted. All these categories are all manifestation of corruption in PPP projects. Other administrative and managerial factors can lead to contract renegotiation in PPP road projects renegotiation. These may include errors during the bidding process, bureaucratic delays occasioned by bureaucracy and other human-related problems, e.g., nonchalant attitude of the handlers (Guasch et al., 2014).

Also, the availability of competent workers in PPP projects can assist in the achievement of positive results or outcome for members of the public (Willoughby, 2013; Reside and Mendoza, 2010). Hence, the need for considerable professional expertise and knowledge in the management of the contract, especially at renegotiation cannot be over-emphasised. Estache et al. (2008) identify proper experience and knowledge in the management of the construction process as a pre-requisite for successful renegotiation of PPP road projects. Numerous works of literature have also recognised the effectiveness of contract enforcement as one of the factors leading to renegotiations in PPP road projects (De Brux, 2010; Athias, and Nunez, 2008; Estache and Serebrisky, 2004). Thus, for a contract to achieve its expected results, there must be adequate and efficient contract enforcement during the management of the contract by the appropriate government agencies representatives, consultants or project stakeholders.

3.9.7 Institutional Factors

Renegotiation can also take place in PPP road projects because of the activities of some public agencies that are saddled with the responsibilities of making some vital decisions on behalf of the government particularly during the process of implementation of the contract (Guasch et al., 2014). Since PPP, the respective bodies saddled with the responsibility of governance and administration governs projects. The governmental agencies take several decisions about the processes and procedures, which affect the renegotiation process. Corporate and regulatory institutions are vital to the sustenance of PPP (Engel et al., 2009).

There is, however, literature finding, which indicates that the regulatory institutions required for PPP are inadequate and, in some cases, there is the lack of regulatory systems (Guasch and Straub, 2009a; Engel et al., 2009). Hence, these have constituted one of the factors leading to PPP renegotiations across infrastructure sectors including road sector. Availability of adequate organisations to provide corporate governance of the PPP implementation process will help towards the reduction of the negative impact of renegotiation on PPP infrastructure projects especially road projects.

3.9.8 Regulatory and Legal Factors

Regulatory and legal factors leading to the renegotiation of PPP road contracts are numerous and include the availability of regulatory institutes; poor or inadequate of regulatory account; type of tariff regulation; governance and regulatory effectiveness; specific legal changes and weak legal environment including high or incremental changes to corporate tax and levies. However, changes to PPP legal and procurement framework and weak regulation regarding investment/performance have been identified as pertinent to PPP renegotiations in the road sector (Montecinos and Saavedra, 2014; Estache et al., 2003). The results as revealed in Table 3.4 show that regulatory and legal factors have the highest number in comparison to all other categories of factors leading to the renegotiation of PPP road projects. The findings, therefore, implies that the renegotiation of PPP road projects is mostly related to regulatory and legal reasons.

Within the regulatory and legal category, weak or inadequate regulatory account, which can serve as a framework and processes that guide the renegotiation of PPP projects have been attributed to the series of negative renegotiation results in infrastructure projects, especially in PPP road projects (Guasch et al., 2014). The weak and inadequate regulatory account as indicated in Table 3.4 represents the main regulator factor influencing PPP road projects. The lack or insufficient transparency in the PPP renegotiation process has been prevalent because of the inadequacy of necessary regulations that can ensure that project participants activities are evaluated in such a way as to encourage implementation of the project in the most transparent manner. Hence, there is a need for a clear framework, which spelt out the modalities for contract renegotiation. Other factors leading to the renegotiation of PPP infrastructure road projects are the type of tariff regulation or agenda and the degree of autonomy of the regulator and ability to make an independent decision. Also, the level of transparency of the operational framework and processes within the stipulated regulation, governance or failure of the rules and increase in tax of the corporate organisations are other factors considered as leading to the renegotiation of PPP infrastructure road projects.

In addition to these regulatory factors, legal changes, which are unique to each PPP road concessions, other regulatory and legal factors in their respective order or importance include type of tariff regulation; governance and regulatory effectiveness; specific legal changes and weak legal environment including high or incremental changes to corporate tax and levies (Sarmento, 2014, Cruz and Marques, 2013a; Reside and Mendoza, 2010). The specific legal changes could involve changes to the concession contract and the additional clause to further the scope of the original agreement. A weak legal environment tends to quickly lead to statutory modifications of the contract terms, unlike a strict legal situation where there are stringent requirements for making specific changes to the contract provisions.

3.9.9 Political Factors

The prevailing political environment is another factor, which influences renegotiation of PPP road projects. The respective political situation such as a change in government or change in the priorities of the government could affect the renegotiation of PPP road projects to a considerable extent (Sarmento, 2014; Bitran et al., 2013).

The change in government may warrant policies change as well as priorities changes. Thus, the need for renegotiating existing or ongoing PPP infrastructure projects (roads inclusive) may emerge. Furthermore, the electoral cycles in each country could drive the renegotiation of PPP road projects. Literature has identified that the award of concession contract shortly before or soon after elections in most instances influence the renegotiation of PPP projects as this may make either or both incoming and outgoing governments to behaviour opportunistically (De Brux, 2010; Engel et al., 2009).

Moreover, each jurisdiction has a clear motive or agenda to achieve during the administration or tenure of such government. These reasons constitute the cardinal objective, which guides the procurement decision of governments across the countries. It, therefore, suggest that any terms of awarded or ongoing PPP projects, which does not align or agrees with the objectives of the government are discarded and replaced with ones that coincide with the agenda and motives defined by the government. However, these are achieved through the renegotiation of PPP projects. Hence, the reason for attaining the electoral/political agenda of the government is also another political factor, which is one of the influencing factors of renegotiation in PPP road projects (Montecinos and Saavedra, 2014).

The literature acknowledges that a more corrupt environment leads to more firm-led renegotiations and significantly reduces the incidence of the government led one (Guasch and Straub, 2009a). Contrastingly, less renegotiation occurs in an environment where corruption is less prominent. The financial crime experienced in PPP procurement has been found to be

committed by political office holders, which have been identified to be the public stakeholder of the PPP infrastructure projects. The corruptions attributable to political factors include but not limited to outgoing government intentional increase in contract sum to transfer repayments to incoming governments and initiation of PPP projects during electoral years for political gains etc.

All the identified manifestation of corruption has resulted in policy discussion and debates in scientific and academic journals over the last few years, especially developing countries. Nationality and affiliation of the concessionaire of the stakeholders are also identified as another factor influencing the renegotiation of PPP road projects (Guasch et al., 2004; Estache et al., 2003). The reason for this may be on biases or sentiments of the principal stakeholders or contracting parties.

3.9.10 Environmental Factors

There is evidence from the available literature that some environmental-related factors, which include the impact of the external environment such as erosion, landslide, and earthquakes, could lead to the renegotiation of PPP projects in the road sector (Menezes and Ryan, 2015a). Further observation revealed that proper understanding and appreciation of all environmental factors might assist in the appropriate management of the projects, which may include the reduction of costly renegotiations. Thus, the renegotiation of PPP projects is influenced by the impact of any of these environmental problems during the implementation of PPP projects (roads inclusive). The environmental factors in this regard encompass but not limited to all physical factors, which relate to the physical environment within which a construction project is located, which could include but not limited to the conditions of the ground, and weather patterns.

Therefore, relevant PPP studies have attributed the environmental drivers of renegotiation in PPP projects to one or more of the identified physical influences of construction development projects. For instance, changes in design due to environmental reasons/requirements have been recognised as one of the factors that affect PPP road projects renegotiation (Cruz et al., 2015; Menezes and Ryan, 2015b; Miranda Sarmento, 2014a). Inclement weather and other environmental challenges such as floods, erosion amongst others could become more severe and pose some threats in such a way that construction work will become practically impossible to execute. These could also be regarded and categorise as environmental problems, and challenges are affecting the development of Infrastructures PPP projects (Cruz et al., 2015; Menezes and Ryan, 2015b). Furthermore, the changing impact of weather conditions could pose a difficulty to the continuation of the construction of the facility or road projects, which could give rise to renegotiation of PPP road projects (Menezes and Ryan, 2015b).

Other environmental factors could be traced to the act of God, e.g. earthquake, erosion, tsunami, terrorism, and landslides. Archaeological findings of the construction location can tremendously influence the construction site activities and could necessitate the renegotiation of contract terms. The outcome of this exercise could affect the project completion time regarding the extension of the contract duration because of the delay experienced during the construction process because of archaeological issues.

3.9.11 Social Factors

Social factors are causes of contract renegotiation in PPP road projects. The literature has identified that the accruable cost of the PPP road projects must be acceptable to the potential users and members of the public and there should be the readiness of potential users to pay for the road services (Domingues and Zlatkovic, 2015; Guasch et al., 2007a). Recent literature has questioned the social acceptability of PPP for the delivery of road projects to the users and taxpayers (Sarmento, 2014; Guasch and Straub, 2009a). These indicate that the viability and feasibility of successful VfM implementation of the PPP road projects are in doubt. Adair et al. (2011) corroborate the submissions of the many PPP kinds of literature by attesting to the several social concerns, which could arise regarding the acceptability of PPP projects. One of the concerns is the enormous profits generated by the private sector, which is to the detriment of the procuring authority and members of the public, users or taxpayer because of the high charges.

The intention of the PPP initiative by the client is to provide social services for the members of the public. Hence, the public client takes the responsibility of ensuring that such facilities meet the satisfaction of the users or the members of the public, especially in the event of renegotiation. Though, the users have the right to reason regarding the utility of the services provided and express their level of satisfaction through the appropriate quarters. Public opinions, demonstrations and protests regarding nature, quality and operation of the road network could lead to renegotiation request by the clients or procuring authorities whose main objective of initiating PPP road projects is to ensure the satisfaction of the members of the public and the users.

3.10 OUTCOMES OF THE RENEGOTIATIONS

As discussed in the succeeding parts of the thesis, renegotiation could impact any of the criteria of VfM (Sarmento, 2014). The impacts of PPP road projects renegotiation could result in an outcome, which could be positive or negative (Nikolaidis, and Roumboutsos, 2013; Guasch et al., 2007). Therefore, the outcomes of PPP road projects renegotiation have been identified in the literature as illustrated in Table 3.5.

Table 3.5: Outcomes of the Renegotiations

S/N	Outcome	Transport Mode	Country / Region	Literature Sources														Number of Citation
				Baeza and Vassallo (2010)	Athias & Saussier (2007)	Guasch et al. (2014)	Guasch (2005)	Sarmento (2014)	Reside & Mendoza (2010)	Guasch (2004)	Cruz et al. (2015)	Estache et al. (2008)	Kain (2007)	Gifford et al. (2014)	Cruz & Marques (2013b)	Bitran et al. (2013)		
1	Toll modification, e.g. from toll to a non-toll regime and extension of the period of concession		Spain, US, Latin America	v	v									v				3
2	Improvement of the terms of the operator and / or Investors		Latin America			v												1
3	Reduction of quality for users	All	Latin America			v												1
4	Higher tariff charged to users, which is beneficial to the concessionaires	All mode	Latin America			v	v			v								3
5	Direct compensation or subsidies by the government	Road	Spain, US, & Latin America	v					v		v							3
6	Extension in the length of the concession contracts	Road	Portugal, Latin America	v			v			v								3
7	Excess aggregate revenue growth above the projected level	Rail											v	v				2
8	Deficits caused by higher than expected costs and lower than-expected traffic	Rail											v					1
9	Increase in investment requirements level occasioned by currency crisis	Road & Rail			v						v							2
10	Adverse fiscal impact by increasing direct and contingent liabilities to the government	All	Latin America			v										v		2
11	Efficiency reduction						v											1
12	Redefined investment plans	All										v						1
13	Unexpected tariff changes (increase or decrease)	All	Latin America				v				v	v				v		4
14	Delays in investment obligation targets (leading to reduction)	All						v										1
16	Increase in the number of cost components with automatic pass-through to tariff increases	All						v	v									2
17	Financial rescue of projects	All	Latin America					v										1

All the identified outcomes in Table 3.5 shows that contract renegotiation in PPP could result into cost difference such as increase or decrease in the contract sum, or cost of construction in a situation where the renegotiation occurs at the construction stage. Hence, the outcome of the renegotiation can be an increase or derease in cost while the impact can be related to cost (Sarmento, 2014; Guasch, 2005). Thus, the renegotiation of PPP projects could, therefore, be positive or negative (i.e., through an increase or decrease in cost to the client).

Moreover, the renegotiation could also lead to a situation where there is neither increase nor decrease in the cost of PPP road projects (See discussion in subsection 3.7.1). Sarmento & Renneboog (2014) corroborates this through the identification of the outcome of abnormal frequencies of renegotiations totalling 254 renegotiation events in Portugal PPP transports projects. The continuing payment by the public sector over the extended concession period increases the whole life cost of the contract, which is one of the outcomes of PPP renegotiations in the road sector (Sarmento and Renneboog 2014). The continued payment by the client implies that there is a cost overrun, which requires additional payment through either direct financial compensation, financial rescue of the projects or subsidies (Sarmento 2014).

Moreover, Baeza & Vassallo (2010) also gives the outcome of renegotiations in Spain to include Toll modification (50%), an extension of the concession duration (24%), and other results (26%). These suggest that toll modification is the most likely outcome of renegotiation in PPP projects. Toll modification means either increase or decrease in toll fees paid by the users or members of the public. Hence, when there is toll modification, there could be an increase in user charges in the case of PPP toll roads. Furthermore, the incidences of renegotiations of road projects according to Acerete et al. (2010) have resulted in higher charges for road users in Spain. This study also concluded that Spanish government bear the substantial cost of providing eight concessions through subsidies to the private concessionaire to ensure the viability of the road schemes (Acerete et al. 2010: Acerete et al., 2009). However, the same situation is not the case for private concessionaires, as most of the renegotiations in the transport sector (road inclusive) have been found beneficial regarding the profits generated amongst other project benefits (Acerete et al., 2009).

The submissions of numerous renegotiation studies in Latin America can be summarised and supported by the findings of the literature (Guasch et al., 2014; Estache et al., 2008; Guasch and Straub, 2009). This literature identifies the central issues in the renegotiation process to include the adjustment of tax and fees, review of private sector company investment obligations, revision of cost, changes in the base of assets and concession contract extensions, which are all remedial actions based on the outcomes of the renegotiation. It is, however, worthy of note that the

outcomes of PPP renegotiations particularly in the transport sector have generated significant questions regarding the viability of the PPP approach in delivering VfM for the public sector (Sarmento, 2014). However, Xiong & Zhang (2014, p.1) contrast these findings and as follows, *"International PPP practices have shown conflicting results in concession renegotiations."* These suggest that PPP projects outcomes (including renegotiation results) differ from country to country and from an infrastructure project to the other. Though the VfM challenge of renegotiations has been identified, renegotiations have been advantageous in some instances as it had assisted the public and private partners to reduce future uncertainties, share the risks and opportunities, and maximise common utility in some PPP projects (De Brux, 2010).

Some scholars argue that renegotiations, which leads to adverse outcomes evidenced in substantial public financial guarantees had caused massive public resources to be devoted to covering private sector losses in PPP projects (Xiong and Zhang, 2014). The rescue of the PPP projects through fiscal adjustment and rebalancing has resulted in damages to the procuring authority, which is transferred to the users in the future in the form of higher tariffs and charges (Sarmento and Renneboog, 2016). These higher fees erode the VfM available for the users and members of the public. Xiong & Zhang (2014) state that renegotiation experiences have revealed that host governments must compensate concessionaires for their losses on most occasions during contracting. This practice of paying the SPV is premise on the fact that the government is the ultimate owner of the PPP contract with the responsibility of ensuring the success of the partnership for the benefit of the users, which encourages frequent intervention through the financial rescue and rebalancing of the concession contracts (Nikolaidis and Roumboutsos, 2013). As a result, the least consideration is given to the termination of the project during the renegotiation process.

Due to the desire of the public sector to complete PPP projects and commission it for the use of the members of the public, despite the massive cost of renegotiations, the outcomes of most incidences of renegotiation have not favoured the public sector. The literature confirms that most renegotiations in the transport sector especially road projects have addressed the viability of the concession contracts to ensure a profitable return to the private sector towards the success of the partnership (Acerete et al., 2010; Baeza and Vassallo, 2010). The poor or non-achievement of VfM, which is the common outcomes of renegotiations support the submissions of the literature that PPP renegotiations within the transport sector have not achieved VfM for the public sector (Sarmento and Renneboog, 2014; Hodge and Greve, 2009; Grimsey and Lewis, 2005). Thus, the central question regarding PPP renegotiation especially in the water and transport sectors is based on the level at which it delivers VfM for the public sector (Guasch et al., 2014; Sarmento, 2014).

Based on the non-achievement of VfM claim (Sarmento, 2014), remedial actions in PPP renegotiations are taken to address deviations in the VfM criteria (Sarmento, 2014; Guasch et al., 2014; Zhang, 2005). Some of the remedial actions on the requirements of VfM that can be adopted are in the literature that is related to the renegotiation of PPP's as shown in Table 3.6.

Table 3.6: Remedial Actions Occasioned by Outcomes

S/N	Remedial Actions	Literature
1	Changes in government payment e.g. direct financial compensation to the SPV, and government financial rescue arrangement	Guasch et al., 2014; Sarmento 2014b; Sarmento and Renneboog, 2014; Baeza and Vassallo, 2010; Athias and Saussier, 2007; Guasch et al., 2004
2	Review of SPV's Profit	Fatokun et al., 2015; Estache et al.,2009a; Ho, 2006; Acerete et al., 2010; Baeza and Vassallo, 2010
3	Changes in payment mechanism necessitating increase or decrease in payment.	Akibyikli and Eaton, 2005; Sarmento, 2014; Soomro and Zhang, 2010; Akbiyikli, 2011
4	Aggregate revenue growth exceeded the revenue projection set at the bidding stage	Engel et al.,2011 ; Estache et al.,2009 ; Estache et al., 2008 ; Kain, 2007
5	Toll increase or extension of the length of concession	Xiong and Zhang, 2014; Acerete et al., 2010; Baeza and Vassallo, 2010; Engel et al., 2006
6	Redefined investment plans or reduction in investment obligations	Guasch et al., 2014; Reside and Mendoza, 2010; Estache et al., 2008; Guasche et al., 2004
7	Higher tariffs and charges to users	Xiong and Zhang, 2014; Sarmento, 2014; Guasch et al., 2014; Acerete et al., 2010
8	Review of quality and performance	Estache et al., 2009; Harris, 2003; Freeman, and Beale, 1992
9	Construction cost review	Engel et al., 2008; Ahadzi, and Bowles, 2004
10	Review of O & M cost	Ho and Tsui, 2009 ; Blanc-Brude et al., 2006 ; Akintoye et al., 2003
11	Revision of Cost of risk transferred	Bitran et al., 2013; Medda, 2007; Guasch and Straub, 2006
12	Review of construction and concession duration	Engel et al., 2009; Ho, and Tsui, 2009; Hart 2003
13	Review of private sector management expertise and skills	Public PPP Malaysia, 2009; Ahadzi, and Bowles, 2004; Pitt et al.,2006
14	Changes based on the use of output specification	Guasch et al., 2014 ; Bitran et al., 2013 ; Cruz and Marques, 2013a
15	Revised service delivery modalities	Kamugumya, and Olivier, 2016; Byiers et al., 2016
16	Project finance cost	Engel et al., 2010; Ho and Tsui, 2009
17	Whole life cycle cost review	Sarmento, 2014 ; Blanc-Brude et al., 2006
18	Review of concession duration	Baeza and Vassallo, 2010; Guasch et al, 2008

The results or outcomes of the renegotiation of PPP projects have been found to be numerous as shown in Table 3.6. Other studies indicate that governments have had to step in to rescue individual projects through subsidies and direct payment to the private concessionaire (Sarmento, 2014; Baeza and Vassallo, 2010). Financial rescue and rebalancing of the concession contract have been the remedial action of the government in response to the negative outcome of the 254 renegotiations in Portugal's PPP transport projects (Sarmento and Renneboog, 2014). These findings corroborate the findings of concession renegotiations in Spain where the government

have had to intervene by financially rescuing the road projects before agreed completion date to forestall the extension of concession duration, contract incompleteness and possible abandonment (Baeza and Vassallo, 2010).

Government intervention through financial rescue arrangement is usually due to the outcomes of renegotiation particularly in a situation where there is an increase in concession contract cost (Acerete et al., 2010; Acerete et al., 2009). The government may also intervene to rescue the project in the event of the extension of the contract duration, modification of tolls amongst others. Therefore, the remedial actions that can be taken by the procuring authority could be direct compensation through payment or subsidies to the private concessionaire or modification of shadow toll amongst others as shown in Table 3.6.

3.11 SUMMARY OF THE CHAPTER

The chapter has succeeded in examining renegotiations from the theoretical perspectives from the respective types and classifications. The definitions provided by various PPP renegotiation authors assisted in the full appreciation of the concept of renegotiation. Renegotiation request mostly involves the private sector partner. The client also has a few instances of renegotiation requests. The renegotiation experiences across countries reveal that the water and transport sectors undergo renegotiations in most situations in comparison to other infrastructure projects. In the transport sector, however, the road sector has a high percentage of renegotiation, which is prominently at the request of the SPV/ concessionaire. The findings of the literature further reveal the factors leading to the renegotiation of PPP road projects in the transport sector. These factors are categorised according to the respective stages of implementation and are in their order of literature prominence as follows: regulatory and legal factors, tendering and bidding factors and design and planning factors amongst others.

The experiences of renegotiation especially in Latin American, Spain and Portugal reveal that the critical issue is the challenge of VfM achievement for the public sector. Contrastingly, the private sector partner has been found to maximise the gains of the renegotiations through the performance of own objectives (i.e., profits). Though, the renegotiations of PPP road projects have been observed to impact the VfM criteria as evidenced in this chapter. Remedial actions are, however, available for appropriate application to keep the PPP project on track and in conformity with expected outcomes and project objectives. Having established that there are a relationship and a gap between the renegotiation of a PPP road project and VfM, there is a need for an evaluation of VfM in general and specifically about PPP road projects. The succeeding chapter, therefore, addresses these lacunae in the literature.

CHAPTER 4 VALUE FOR MONEY IN PUBLIC PRIVATE PARTNERSHIP PROJECTS

4.1 INTRODUCTION

The public client has acknowledged value for money as the principal reason for the adoption of PPP for infrastructure project delivery. It is essential that there is the achievement of VfM in PPP infrastructure projects for all the stakeholders, especially the client. The identification of the achievement of VfM as an issue in PPP infrastructure projects, especially in the water and transport sectors informs the decision to evaluate VfM criteria in PPP project environment in this chapter. The chapter particularly referenced PPP road projects as stated in Objective 2 in Chapter 1 (See section 1.4). There is a further establishment of the relationship between VfM and renegotiation in PPP projects before the evaluation of VfM criteria and payment mechanisms in PPP environment. An assessment of recent PPP studies revealed that attention has mostly focused on VfM in general infrastructure projects. However, the relationship between VfM and contract renegotiation seems to have inadequate empirical findings in the academic literature. These, therefore, prompt the review of the literature in this sphere, which follows an explicit discussion of the subject of renegotiation concerning VfM.

The chapter further extends the frontier of knowledge by exploring value for money in its entirety regarding concept, stakeholder's perspectives and objectives. There is also the discussion of the measurement and evaluation of VfM in PPP infrastructure projects. The chapter concludes by examining the successful implementation of PPP road projects at renegotiation based on the achievement of VfM for the stakeholders. Measures and general suggestions, which can foster the achievement of VfM are enumerated. The chapter concludes by providing an explanation of topical issues, which substantiates the need for the integration of VfM into the renegotiation of PPP road projects. The summary of the literature findings on matters bordering on VfM in PPP road projects renegotiation concludes the chapter.

4.2 THE CONCEPT OF VALUE FOR MONEY

Value for money (VfM) is the optimum combination of the whole life cycle costs (Boussabaine and Kirkham, 2008; HM Treasury, 2007). The combination of the Whole life costs (WLC) implies that there is the summation of all the costs associated with the project during the entire life cycle of the project. Soomro and Zhang (2010, pp. 1) describe VfM as follows, *"bringing efficiency, economy, and effectiveness of the services, processes, or the creation of a solution to problems through best possible utilisation of available resources."* This definition implies that the critical VfM consideration in PPP is ensuring efficiency, effectiveness, and economy while also utilising the resources optimally to achieve workable solutions to economic problems. Akbiyikli and Eaton (2006) substantiates these by stating that economy represents cost and quality of resources, efficiency is the ratio of output to the level of resources and input used, and effectiveness is the extent to which the actual results matched the expected or desired results. Hence, VfM can be considered achieved when services are efficiently provided at an affordable price and defined quality.

Also, VfM represents a robust and complex process, and an analytical tool applied in the life cycle of the project, e.g., feasibility, selection, and evaluation amongst others (Morallos and Amekudzi, 2008). VfM, therefore, helps to evaluate the worth and quality of an infrastructure project over the life of the project. A VfM situation presents itself where the total net present value (NPV) of cost of private sector supply is less than the NPV of the base cost of the service. Moreover, there is an adjustment for the cost of risks retained by the government, and transferable risk to the private sector partner (Pangeran et al., 2010). Hence, the motive for initiating private provision of public infrastructure projects is VfM (Soomro and Zhang, 2013; Soomro and Zhang, 2011).

Since VfM is the paramount consideration in any PPP infrastructure investment, it is necessary and expedient to apply quantitative and qualitative tools in a project environment to provide a proper justification of the organised capital outlay. The application of necessary modalities, which ascertains the worth, quality and overall costs of a project is crucial as it compares the total cost throughout the project implementation stages to the defined benchmark specified at the formation of the contract (Coulson, 2008; Morallos and Amekudzi, 2008). Thus, VfM evaluation is necessary as it assists in achieving stakeholders project objectives in a PPP environment.

VfM is, therefore, a central, fundamental and principal objective of any infrastructure project development (Henjewele et al., 2011). Therefore, the achievement of VfM at any stage of PPP implementation process creates a lasting impact throughout the lifecycle of the PPP infrastructure project.

Since, PPP infrastructure projects are procured when there are possibility and certainty of achievement of VfM. During the evaluation of the prospects of achieving VfM in an infrastructure PPP project, the procuring authority usually carries out VfM analysis at the inception of the contract, which precedes the choice of PPP as the preferred procurement decision.

The essence of the VfM analysis is to ensure that the proposed infrastructure project will first deliver VfM for the public sector and all other stakeholders (Yuan et al., 2009; Shaoul, 2005). The literature states that a thorough evaluation of the financial requirements of infrastructure projects at the initial stages of the project, especially during the process of bid evaluation is essential (Grimsey, and Lewis, 2005; Akintoye et al., 2003). The reason is on the assumption that the assessment of financial requirement helps to ensure the achievement of VfM and secures for the primary stakeholders an in-depth knowledge of the bids submitted including an understanding of the strength and weakness of the financial proposals (Soomro and Zhang, 2013; Soomro and Zhang, 2011). Hence, to achieve VfM in an infrastructure project development, knowledge of the characteristics and peculiarities of the investment proposals cannot be over-emphasised.

4.3 STAKEHOLDERS VALUE FOR MONEY PERSPECTIVES

There is the need to understand and appreciate the perspectives of the stakeholders in a PPP infrastructure project regarding VfM. The stakeholders are the main parties with vested interest in the delivery of the infrastructure projects for the benefit of the users and the members of the public. Though the public client, SPV, and the financial lenders are the stakeholders having a primary interest in the successful delivery of the infrastructure projects in PPP (Delmon, 2010). However, the road users are also stakeholders that are not directly involved in the partnership agreement. The perspectives of all the stakeholders, i.e., the public client, SPV or private sector partner, financial lenders and the users of the road regarding VfM differ from one another significantly. Based on the differences in the perspectives of the stakeholders, this section discusses coherently and transparently the respective views of the stakeholders, especially the primary parties to the partnership agreement.

4.3.1 Clients Value for Money Perspectives

The public partner stakeholder is the procuring authorities at every level of governments which is responsible for the initiation of the PPP infrastructure projects. The government agrees with the private sector company to enter into partnership towards the delivery of PPP projects on the understanding that the VfM objectives defined at the contract inception are achieved. The public client ensures that VfM is achieved from the inception of the contract by weighing the possibility for the performance of a PPP project through the estimated cost against the cost of executing the

project through the traditional method of procurement (Yuan et al., 2009). Hence, a PPP project is usually reckoned by the client to be able to deliver VfM in terms of cost, if the cost of executing the project through PPP is less than the cost required to implement the project through the traditional procurement method. The literature has attested that the selection of a profitable and viable infrastructure project by the client is guided by the principle of "*3E's*", which seeks to achieve low cost for greater outputs and right results at first attempts (Muvirimi, 2012). Hence, the perspective of the client regarding cost is based on the understanding that the lower the cost, the better the investment decision.

Primarily, PPP tends to attain the objective of VfM only in a situation where members of the public and users have been able to derive the desired level of utility based on affordability of the service provided (Sarmento, 2014). The view and overarching objective of the public-sector client in PPP project delivery is to achieve users' satisfaction with the services provided by the private sector company. The client principal objective in any given PPP initiative has been to ensure that the users of the product derive utility and satisfaction from the use of the facility. Hence, the achievement of VfM by the client is premised on user's satisfaction.

Henjewele et al. (2011) further corroborates previous submission of the literature by identifying VfM as the most compelling reason for public client initiative in a PPP environment. Therefore, the achievement of VfM by the procuring authority means the provision of affordable roads culminating in reasonable and economic tariffs imposed for the use of the PPP facility (Santandrea et al., 2015). The imposition of tariffs and charges by direct toll charges to the users of the facility or government payments to the SPV should be such that it is affordable and economical to the users. Clients also expect that payments to the SPV during the implementation stage in the case of shadow toll should be economical and should offer useful results and satisfaction to the users. Thus, user's satisfaction should not only be the goal of the client in a PPP project but all the stakeholders.

4.3.2 Private Partners Value for Money Perspectives

The private partner is the Special Purpose Vehicle (SPV) also referred to as concessionaire (Marques, and Berg, 2011; Bing et al., 2005). The perspective of the private sector regarding the achievement of VfM in any given infrastructure project is by its ability to bear the risk transferred towards obtaining maximum profits on the investment (Grimsey and Lewis, 2005). The financial requirement is the first consideration of the private sector followed by the technical needs of the project before the calculation of the time it will take to recoup the investments in the infrastructure project. The estimate of the investment returns is by the preparation of the cash flow analysis at an appropriate discount rate (Bain, 2010).

The risks of the project along with other factors are weighed and compared to the capability of the project to generate the desired level of profits while also assessing the possibility of achieving VfM on the PPP project (Muvirimi, 2012).

The perception of VfM based on ability to generate profits on investment differs from the objectives of the client, especially as evident in the PSC and PPP bid analysis usually carried out at the feasibility stage of infrastructure project procurement. Grimsey and Lewis (2005, p 357) substantiates this submission by stating concerning the clients VfM perspective as follows: *"Assuming all things equal (i.e., quality and risk allocation), value for money is demonstrated when the total present value cost of private sector supply is less than the net present value of the base cost of the service, adjusted for the cost of risks to be retained by the government, cost adjustments for transferable risk, and competitive neutrality effects."* These implies that the cost to the SPV must be lower that the cost generated from the use of the facility, especially in the case of a toll road. Hence, clients seek to ensure that the cost to the private sector does not increase during the life of the project in such a way that VfM is eroded.

4.3.3 Financial Lenders Value for Money Perspectives

The lenders are the credit grantors who are responsible for providing credit and equity for the project executors, i.e., the SPV or the private partner and the client. Though, the SPV heavily relies on the financial resources provided by these institutions. The lenders and credit grantors could be commercial banks, insurance companies, equity investors, lessors amongst others. These lenders, however, have unlimited access to credit facilities (Akbiyikli et al., 2011). The financial constraint of the public client and the limited financial resources of the private concessionaire often necessitate recourse to the credit facilities of these lenders by both public and private sectors for the execution of PPP projects. The financial lenders can only release the funds at its disposal just in a situation where it is satisfied that the funds can be recouped. Therefore, the SPV must prove the feasibility and viability of the investment proposal to the financial lender and fulfil other requirements among which is the provision of collateral to gain access to funds required to execute the PPP project.

4.3.4 Road Users Value for Money Perspectives

Though, user's satisfaction should be the goal of the PPP project delivery process. The understanding of the user regarding VfM achievement in PPP is different from the perspectives of the private sector. The private sector partner usually finds every means possible to transfer the cost, which is the financial risk borne at the technical implementation of the project delivery for the benefits of the users and significant profits to the operator. Higher charges to the users and considerable gains to the concessionaires because of the risk transfer have been found detrimental

to the motive of the PPP investment (Adair et al., 2011; Acerete et al., 2010). Adair et al. (2011) indicate that a good percentage of PPP projects was unacceptable to the users of the facility and members of the public on the ground of the high profit generated by the private partner. Hence, there is the need for a conscious effort to address this trend during the implementation of PPP projects.

Though, the private sector partner is in business to make profits and generate returns on investment as identified in the literature (Spence and Rutherfoord, 2001). However, the maximisation of profit by the private sector partner should not be detrimental to the economic objective of the partnership. The achievement of VfM implies the delivery PPP infrastructure products that are economical to the users and are void of high service fees or government payments during the operation of the facility. A fair profit to the private sector partner is essential and the VfM defined for the project at the contract formation stage should not be compromised as it is the desirable outcome expected by the public client.

4.4 EVALUATION AND MEASUREMENT OF VALUE FOR MONEY

Governments, international organisations, and international financing institutions (IFIs) around the world have adopted the VfM concept as its principal objective in infrastructure projects delivery (HM Treasury, 2014). It has become a frequently used method and criterion for selection and evaluating infrastructure projects, making capital budgeting decisions, delivering public infrastructure projects with lower cost and limiting the risk to the public sector (Prokopowicz, 2014). VfM evaluation technique for measuring the profitability and benefits of investment decisions is the most comprehensive, analytical and management technique applied by governments for evaluation of transport projects (Prokopowicz, 2014). The assessment, therefore, entails the appraisal of the advantages of various schemes for project design, assessment, implementation and monitoring of the project lifecycle for efficiency and effectiveness.

The stakeholder's perspective or objective is usually adopted to estimate whether a project is providing VfM for the stakeholder or not. The basis for the definition of stakeholders' goals is to foster sound achievement of VfM in the procurement of infrastructure projects. Governments as clients of public projects measure VfM in infrastructure highway projects through the instrument of the Public-Sector Comparator (PSC) (Coulson, 2008). Ismail (2013) also, state that the PSC is used in the measurement of VfM to ascertain the profitability of the private sector investment proposal regarding its ability to achieve VfM for the public sector in comparison with the traditional form of infrastructure projects procurement. The PSC method is used to evaluate investment proposals at the early period of infrastructure concession to benchmark competing bids for VfM achievement (Sarmento, 2010).

There is the evaluation of the PSC by taking into consideration all estimates of costs, risks, and revenues, which are all, set out in the form of cash flows with the inclusion of discount rate for the public sector towards the determination of the Net Present Value (NPV) of the project (Sarmento, 2010). The calculated PSC at this point is on a comparative basis with the offer proposed by the private party according to the payments value, costs and public sector retained risks (Cruz & Marques, 2013). The PSC can then be used to assess the PPP projects at the respective stages of PPP procurement.

The belief that price alone is an indication of VfM has proven wrong, as the best VfM is unattainable in a project environment where the basis for tender or bid acceptance solely relies on the lowest costs or tender. Parker (2013) corroborates these by stating that the procuring authorities in PPP projects development cannot get the best deal or VfM if the focus is to always accept the lowest price from a potential investor or concessionaire. Hence, there is more to achieving best VfM in PPP environment than price or acceptance of the most economical bid. Therefore, the process of procurement within government operations can only result in VfM when some guiding principles and measurement standards are available. These principles and measurement standards include tough and open competition among contractors, suppliers, and providers of services amongst others including the establishment of a set of criteria for VfM measurement at the respective stages of PPP projects development (PPP Public Malaysia, 2009). In addition to the VfM objective of the public sector, the many stakeholders' intentions in a PPP including the perspective of the private business entities are premised on the profit generated, return on investment and adequate competition to get the best deal (Hodge and Greve, 2007).

The user's satisfaction is another yardstick for measuring the achievement of VfM in a PPP infrastructure project (PPP Malaysia, 2009). The perspective of the procuring authority representing the interest of the users of a PPP service is that the tariff imposed on the product of the partnership should be affordable and economical (Akbiyikli and Eaton, 2006). The service should give satisfaction in use and should be easily adaptable to changing circumstances. Thus, VfM is achieved for the users if the road services provided are of delight and provides the needed utility at less economic costs within the life of the infrastructure project. PPP evaluations are adopted to ascertain whether there is the achievement of the public-sector objectives regarding VfM achieved.

Conclusively, the financial institutions and banks also possess different perspective of VfM. The commercial lenders expect that the contract sustains the agreed interest rates plus all other accrued benefits of the debts to be serviced by the private partner (Estache et al., 2000). Hence, the consideration of VfM by these institutions regarding the adequacy of returns on the loans obtained and the possibility of paying the indebtedness within the stipulated period and as at when due.

Thus, the primary consideration for financial lenders is to gain a maximum return on the amount of money invested in the form of loan awarded to the private sector party (Yescombe, 2011). The measurement of VfM concerns the achievement of the respective objectives of the stakeholders.

4.5 VALUE FOR MONEY ACHIEVEMENT IN PUBLIC PRIVATE PARTNERSHIP PROJECTS

The need for a thorough, rigorous and careful effort during the implementation of PPP infrastructure projects cannot be over-emphasised to ensure achievement of VfM. VfM achievement for the public sector, primarily from inception to the handing over the stage of the project through appropriate assessment before the commencement of the project and during the implementation of the project plan. These submissions agree with the literature that the evaluation of VfM can be carried out at strategic points during the execution of PPP projects (Sarmento, 2010). Hence, this section discusses the assessment of VfM in PPP infrastructure projects from literature viewpoints and perspectives.

4.5.1 Preliminary Assessment of Value for Money

Several studies have identified the need to appreciate the peculiarities of PPP and the VfM requirements to ensure the achievement of the VfM objectives of the stakeholders. For instance, Tanaka et al., (2005) propose a VfM risk assessment methodological approach for developing countries. The risks assessment involves risk about the cost of finance, risks related to; project, price, time and quality deviations, which could be human and environmental related amongst others. Carpintero and Petersen (2014) corroborate the submission of Tanaka et al. (2005) by recommending rigorous assessments of future PPP rail projects in advance. All the risk assessments are, therefore, an aspect towards ensuring effective implementation of PPP project. The risks involved in PPP transport projects are enormous, and as such, private partners are unwilling to accept the risk transfer from the client, especially in developing countries because of increased transaction cost recorded in PPP projects (Vickerman, 2004). Hence, there is the suggestion that there could be an increase in the transaction cost of PPP project because of the failure to thoroughly assess the associated risk at the inception of the contract.

The risk level of road projects has a considerable effect on the success of PPP projects, which eventually impact the achievement of VfM. The risk is a constituent of VfM, which has various categories as follows: political, environmental, contractual, project-based risks at the technical level of implementation amongst others (See Table 3.4). The risk of PPP projects should be allocated equitably among the partners, particularly to the private partner. The fair allocation of the project risks between the primary stakeholders will allow the individual investor to be willing

to assume the risks. Hence, there is an opportunity at the feasibility stage of PPP projects (roads inclusive) for the testing of the proposed investment through the evaluation of all VfM variables to ensure the achievement of VfM. In the UK, for instance, there is the initiation of value assessment early in the program stage when the investment plans are decided (HM Treasury, 2006).

The VfM testing and analysis are carried out at two points during the period of implementation of PPP projects, which are the feasibility stage of PPP projects and the procurement point where there is usually the evaluation of bid. Emphasis on the assessment of VfM at the inception of the contract is necessary since changes during the later stages of the project may result in non-achievement of VfM (Treasury, 2006). Hence, there is the need for prior consideration of VfM at the preliminary stage of the PPP project. VfM descriptions should be included at the inception of the contract for the implementation stages and should encompass all associated criteria of a project including raw cost elements (quantified and valued) and all extra or additional cost that may arise (Ontario, 2007).

The preparation of the bid documents by the public-sector representatives on behalf of the government for approval of the best tender is a crucial point at the preliminary stage where assessment of requirements is necessary (Sarmento, 2010). There is the need for the bid evaluator to ensure at the bidding stage that the bid submitted is used to update the reference Public Sector Comparator (PSC) as indicated in the literature (Sarmento, 2010; Morallos and Amekudzi, 2008). These, therefore, suggest that the VfM may be reassessed based on the VfM targets referenced in the contract at the beginning of the deal. Moreover, the actual information from the bidders can serve as a decision guide at the planning stage regarding the establishment of the VfM target. The decision guide provides an understanding of whether PPP is cost-effective for the public sector initiating such the projects.

Summarily, a sound VfM assessment borders on the appreciation of all the factors, which could impact or influence VfM achievement in any PPP infrastructure project. The reason for this is because VfM is crucial, critical and a statutory requirement, especially in UK PFI (DBFO) road projects (Debande, 2002). Hence, PFI projects require the utmost attention through a thorough assessment of all the variables to ensure that VfM is achieved (Akbiyikli and Eaton, 2006). Therefore, to attain VfM, individual facilitators must be put in place. The literature has shown from experience that the government in British Columbia have used some payments types and mechanisms to achieve state specific objectives (Abdel Aziz, 2007a). These imply that value for money is the statutory requirements of governments, which can be met through appropriate contract mechanisms used for allocating payments to the concessionaire or SPV.

The contract mechanisms are defined and incorporated into the contract at the inception of the agreement by the client for adoption during the implementation of the project to ensure the achievement of VfM.

4.5.2 Assessment of Value for Money during PPP Implementation Stages

PPP project developments span across some stages as identified in the literature (Koppenjan, 2005). These stages include exploration, planning, realisation, and operation (Mustapha and Carrillo, 2008; Koppenjan, 2005). The exploration stage involves the project feasibility and forecasting while the planning stage includes the design and project conceptual development among others (Kopenjan, 2005). The evaluation of VfM is carried out at the strategic aspects of PPP projects (Sarmento, 2014; Sarmento, 2010). The assumption at the project initiation, planning, and design stage is that the project needs are related to the defined objectives that the project intends to achieve (Andersen et al., 2009; Ann et al., 2007). The identified targets are aligned with the budgets developed by the client's representatives on the project. Also, there is the usual practice of assessing the project during implementation to ascertain whether it meets or surpasses the financial, technical and economic requirements (Kumaraswamy and Zhang, 2001). The practice has the possibility of assisting the procuring entity to take necessary actions in a situation where there is a deviation from the requirements formulated at the start of the contract.

The recognition phase is the stage at which the actual construction and development work takes place. The deliverables of this phase are usually evident at the time of service delivery or transfer of the infrastructure to the client (Caldwell et al., 2009). Due to the sensitivity of this stage, it is necessary for a proper evaluation of value for money at the construction, operation stage up to the handing over and commissioning phase to ensure the achievement of a sound VfM. The management of value is essential and desirable during the design and construction phase of infrastructure project delivery. The reason for this submission is premised on the literature understanding that necessary action can be taken to maximise the value of developmental projects from inception to completion (Kelly et al., 2014). Therefore, an evaluation of VfM can be carried out at the respective stages of infrastructure project development to address shortcomings or correct perceived errors during the implementation process. For instance, the literature indicates that the purpose of the VfM assessment in PPP infrastructure projects is to ascertain whether the proposed payment level for the service provided by the concessionaire is justified based on the project benefits or VfM achieved (Muvirimi, 2012).

Therefore, it is expedient and necessary to begin the assessment of PPP projects for value for money achievement with appropriate financial and economic evaluation (Muvirimi, 2012; Grimsey and Lewis, 2005).

The economic and financial assessment regarding the decision made, especially at renegotiations is critical to achieving VfM. The non-achievement of VfM in PPP projects, particularly at the point of PPP infrastructure projects renegotiations necessitate the formulation of assumption for VfM achievement. The assumption is that the stakeholders should ensure that:

VfM achieved at the end of renegotiation ≥ VfM described at contract inception.

The assumption is that the VfM achieved at the end of the renegotiation should be greater or equal to VfM described at the inception of the contract and should be acceptable and beneficial to the stakeholders, especially the public-sector client (Sarmento, 2014b). However, the client can only accept the VfM achieved at the end of the renegotiation in a situation where the VfM described at the contract inception is reached or surpassed. Therefore, any renegotiation that will not provide this result should be regarded as non-beneficial to the stakeholders, particularly to the public sector (Engel et al., 2009). Moreover, there is a need to establish and quantitatively or qualitatively describe VfM required at the contract inception, as that will possibly be the basis for evaluating the VfM achieved at the point of renegotiation (Demirag et al., 2004; Akintoye et al., 2003). The positivity or negativity of the VfM criteria established can be reflective of the quantitative and qualitative indicators adopted in the VfM assessment, which should be defined at the contract inception.

The process of the VfM assessment at the respective stages from the financial close of the contract should be repeated throughout the phases of the PPP project developments to check the conformity of the projects with the defined VfM (Desgrees du Lou, 2012). Though, the findings of this literature indicate current problems in the VfM assessment during the implementation stages, which usually make the VfM analysis hardly reliable. However, there is the possibility of obtaining an accurate assessment of VfM through sound practices to achieve potential solutions to the problem of VfM achievement during the implementation of PPP projects. Though, other extant literature has corroborated the uncertainties in VfM assessments of PPP projects. However, there is still the need to evaluate VfM during the implementation of PPP projects. In estimating PPP projects renegotiation for VfM, there is a need for cross-evaluation and assessment of all financial and non-financial criteria to ensure that the project performance is consistent and increase the chances of project success regarding VfM achievement to the several stakeholders, especially the client (Pangeran et al., 2010).

There is also the need for the assessment of VfM on a continuous basis during the operations of concession projects through effective and efficient audits and appropriate monitoring of contracts caveats (Sarmento, 2010). For instance, PPP infrastructure projects require expert supervision of the VfM provided at every stage of the contract through adequate monitoring to ensure that it is equal or above that defined in the contract documents at the planning and design stage. Since

proper assessment and evaluation of VfM at the respective steps is necessary towards the VfM success of PPP projects, it, therefore, becomes essential to establish the criteria for the achievement of this critical requirement. There is a necessity to ensure that when calculating or testing for VfM in PPP projects, it is essential to put into consideration individual steps and full sets of alternatives. A financial evaluation, which quantifies VfM in monetary terms, is necessary. However, economic and fiscal assessment coupled with social benefits assessment needs to be carried out at the inception of the PPP project (Heald, 2003). These assessments will then serve as a guide and reference point during the implementation stages up to the end of the partnership.

4.6 VALUE FOR MONEY CRITERIA

The literature has identified that VfM is importance in PPP infrastructure project including road projects (Guasch et al., 2014; HM Treasury, 2007; Akbiyikli and Eaton, 2005). Several criteria of VfM for concession projects delivery are identified in the literature, which includes amongst other things user's satisfaction, completion duration, contract cost or budget and returns on investment or profit (Carbonara et al., 2014). Also, there are other primary criteria for VfM adopted in infrastructure project delivery (Public PPP, Malaysia, 2009). The adoption of this criteria implies that to achieve VfM in a PPP project; there is a need for the achievement of individual variables regarded as VfM criteria, which are numerous in PPP procurement across countries. The success of a project regarding the accomplishment of VfM is dependent mainly on the attainment of these criteria, which serves as quantitative indicators for measuring VfM.

The achievement of VfM is also dependent on other VfM drivers or criteria, which are optimal risk transfer between the public and the private sectors, whole life cycle costs, and the use of output specification, which allows bidders to innovate (Public PPP Malaysia, 2009). Besides, a competition provides the fair value of the project, performance-based payment mechanisms, and private sector management expertise and skills. The literature has also established that the primary measure for evaluation of VfM in PPP road projects is time; costs; quality; and user's satisfaction (Fatokun et al., 2015; Liyanage and Villalba-Romero, 2015). Cost, time, quality and users' satisfaction are, therefore, paramount considerations in the establishment of VfM for a PPP project. However, each of these criteria is embedded in one another and has interrelationship attributes. For instance, the user's satisfaction is by the quality of the product (i.e., the road network), the affordability of the road (i.e., user fees) and the travel time on the road network (i.e., journey time reliability), which all adds to the utility derived by the users of the road.

Time is a variable in PPP road projects, which is relative and requires critical investigation because of its impact on VfM. Contract duration and the concession period are vital to all the PPP stakeholders especially the public sector. An extension of concession period because of delay

during construction or renegotiation usually have an impact on the time and attendant effects on the delivery and handing over of the infrastructure to the public investor (Acerete et al., 2010; Baeza and Vassallo, 2010). Cost overrun is also peculiar to PPP projects mainly in the contract stage of transport projects (Acerete et al., 2010; Guasch et al., 2008b). The impact of cost is usually evident at the end of the concession through evidence of increases or decreases in the final costs of materials, equipment, workforce amongst others in PPP projects. The increase in the contract sum because of changes in the cost of materials and manpower amongst others may necessitate the transfer of additional costs to taxpayers in the form of charges in the case of toll roads and higher government payments in shadow tolling arrangement.

The motive of any private investor in an infrastructure PPP is to recoup the expenses incurred in the projects in its entirety and maximise the profits (Cartlidge, 2006). Individual investors always ensure maximisation of profit and return on the investment of all shareholders. Any investment, which will not yield return or benefits, is unattractive to the private investor and not worth the investment (Sarmento, 2014; Corbett and Smith, 2006). One can, therefore, conclude that the criteria that the private sector partner adopt in ascertaining whether a project achieves VfM are the ability of the project to yield returns on investment and generate a substantial profit. Contrastingly, the main criteria used by the public corporation to establish whether there is the achievement of VfM in PPP road projects is the satisfaction derived by the users of the road network. Profit of the private sector stakeholder and the utility derived by the users of the road network are essential criteria to measure the achievement of VfM in PPP infrastructure projects.

4.7 Value for Money in the Renegotiation of Public Private Partnership Projects

One of the principal issues in PPP infrastructure projects is the renegotiation of contract, especially in the water and transport sectors, which has continued to challenge stakeholders involved in the agreement (Guasch et al., 2014; Roumboutsos et al., 2010). Renegotiation of PPP road projects has generated outcomes, which have resulted in user's criticism of the affordability of the product among other related issues (Stafford et al., 2010; Baeza and Vassallo, 2010). Baeza and Vassallo (2010) explain based on renegotiation experiences of two concession period in Spain (i.e., 1967-1975) to substantiates the frequent incidences of renegotiations and their causes. The findings of this study indicate that 50% of the renegotiations in the road sector results to toll modifications, which have led to complaints from users and taxpayers as follows: *"Neither users nor taxpayers have tended to complain very much about this situation (Baeza and Vassallo, 2010; p 303)"*.

Moreover, Stafford et al., (2010) indicate that there had not been proper accounting to users and taxpayers by governments in PPP road projects of Spain and the UK, which suggests that the users and taxpayers have been in a disadvantaged position through this practice. Thus, the study corroborates concerns regarding adequate accountability to taxpayers and citizens that use the roads. Hence, these findings suggest that renegotiation of PPP road projects and the use of PPP for road projects delivery has generated outcomes, which have resulted in user's criticism of the affordability of the product to road users among other related issues such as accountability to the users and members of the public (Stafford et al., 2010; Baeza and Vassallo, 2010). Therefore, the main reason for the criticisms is on the level of VfM achieved for the client. The non-achievement of VfM, especially for the users based on the submission of the previous study suggests that further research is required (Sarmento, 2014).

Corroboratively, other extant literature identifies that the criticism of renegotiation of PPP projects, particularly in the road sector is that such projects have not achieved VfM for the public sector procuring authorities (Cruz et al., 2015; Estache and Serebrisky, 2004). Hence, the issue of renegotiation of PPP projects is the problem of achievement of VfM for the clients initiating such projects. The literature reports the data collected based on the renegotiation experience of PPP projects in Latin American countries (Engel et al., 2014; Bitran et al., 2013; Nikolaev, 2012; Estache et al., 2009; Engel et al., 2009), Portugal (Sarmento, 2014; Cruz and Marques, 2013c) and Spain (Acerete et al., 2010; Baeza and Vassallo, 2010). The literature also reveals the VfM achieved at the renegotiation of PPP infrastructure projects, especially in the road sector.

However, the examination of the research on PPP road projects reveals no substantial empirical information regarding renegotiation of UK PFI (DBFO) road projects (Hasselgren et al., 2014). Though evidence of VfM achievement exists in some PFI (DBFO) road projects in the UK, there is still some evidence of non-achievement of VfM in some instances (Bain, 2010). Enough evidence is available as indicated in Table 4.1.

Table 4.1: Value for Money of PFI Roads Projects in the UK

PFI road	**PFI value for money (NPV £m)**			**Does the PFI represent value for money?**		
	Discount Rate = 8%	**Discount Rate = 6%**	**Discount Rate = 3.5%**	**Discount Rate = 8%**	**Discount Rate = 6%**	**Discount Rate = 3.5%**
A30/35	1	-19	-44	-	-	-
A50	10	8	8	Yes	Yes	Yes
A19	41	40	34	Yes	Yes	Yes
A1(M)	50	30	-3	Yes	Yes	No
A419/A 417	11	-3	-18	Yes	No	No
A69	-5	-12	-17	No	No	No
M40	94	101	126	Yes	Yes	Yes
M1-A1	112	84	57	112	84	57
Total	314	229	143	314	229	143

Source: Adapted from Bain (2010)

Table 4.1 shows that VfM is achieved in the A50, A19 and M40 PFI road projects at discount ratios of 8%, 6%, and 3.5% respectively. A1 (M), however, indicate that VfM is achieved at only discount rates of 8% and 6%. There is evidence of non-achievement of VfM on A1 (M) at 3.5% discount ratio. A419/A417 road projects show proof of non-achievement of VfM at a discount rate of 6% and 3.5% respectively excluding the 8% discount rate, which gives different evidence of VfM achieved. The respective discount rates substantiate our findings in the literature, which identifies non-achievement of VfM at the renegotiation of PPP road projects (Sarmento, 2014; Acerete et al., 2010; Baeza and Vassallo, 2010). However, the non-achievement of VfM on the A419/A417 DBFO projects are unclear regarding renegotiation, but it is based on the calculation of VfM at a discount rate 6% and 3.5% respectively over a period (Bain, 2010). These findings, therefore, suggest that research into the VfM achieved at renegotiation in the context of PFI (DBFO) road projects in the UK is appropriate and have a potential to make an original contribution to knowledge.

The finding of Table 4.1 reveals that PFI road projects recorded considerable level of success based on VfM recorded on most of the road projects. However, the level of VfM achieved on A30/35 DBFO road project, A1 DBFO road project, A419/A417 DBFO road project, and A69 DBFO road project at 6% and 3.5% discount rates are not satisfactory. Thus, one can rightly conclude that there is evidence of achievement of VfM in most PFI (DBFO) road projects in the UK (Bain, 2010).

Though the respective values regarding NPV achieved varies from project to project at the individual discount levels. These agree with the literature, which states that the level of VfM on PPP infrastructure project differ from one project to another (Yuan et al., 2009; Akintoye et al., 2003). There could be measures that stakeholders can adopt to ensure the achievement of VfM on the respective road projects as shown in Table 4.1.

There is the likelihood that the projects identified in Table 4.1 could have undergone renegotiation and still achieve VfM. However, no record of renegotiation in the literature establishes the incidence of renegotiation on any of the PFI (DBFO) road projects in the UK through empirical study (Hasselgren et al., 2014). Therefore, the establishment of the instances of renegotiation in PFI (DBFO) road projects in the UK through empirical findings can assist to corroborate or contrast the results shown in Table 4.1. Hence, this study aims at integrating considerations of VfM into the renegotiation of PPP road projects through the specific objectives outlined in Chapter 1 of this thesis (See section 1.4). The developed framework intends to address the poor and non-achievement of VfM at the several incidences of renegotiation of PPP road projects

through a useful parameter for the primary stakeholders. This sub-section, therefore, evaluates the impacts of the renegotiation on the respective criteria of VfM.

4.7.1 Impacts of PPP Renegotiation on Value for Money Criteria

There are impacts of PPP renegotiations in the literature. Numerous authors have discussed multiple topics about renegotiation including the several criteria and objectives of the stakeholders in PPP infrastructure projects. The long duration of the PPP contract makes it practically impossible for the avoidance of changes and renegotiations (Darvish et al., 2006). PPP negotiations, which occur during the pre-construction period has an impact on the contract bid, including the contract duration at the pre-contract stage (Ahadzi and Bowles, 2004). The implications also extend to the contract stage of PPP projects where there has been a need for the primary stakeholders to renegotiate the contract during the implementation process of PPP (Domingues and Zlatkovic, 2015). It is, therefore, imperative to identify and assess the impact of renegotiation in PPP infrastructure projects especially road projects. The impacts of renegotiation of PPP projects on the respective criteria of VfM as established in the literature are identified in their order of significance as shown in Table 4.2.

Table 4.2: Main Impacts of Renegotiation

S/N	Impacts	Literature	Frequency	Rank
1	Construction cost	Guasch et al., 2014; Ho and Tsui, 2009; Reside and Mendoza, 2010; Athias, and Saussier;2007	4	1
2	Construction duration	Engel et al., 2014; Bitran et al., 2013; Ho and Tsui, 2009; Albalate, and Bel, 2009.	4	1
3	User's Satisfaction	Sarmento, 2014; Guasch et al., 2014; Acerete et al., 2010; Baeza and Vassallo, 2010	4	1
4	Operation & Maintenance (O& M) costs	Ho and Tsui, 2009; Blanc-Brude et al., 2006; Akintoye et al.,2003	3	4
5	Cost of risks transferred	Engel et al., 2014; Bitran et al., 2013; Ho and Tsui, 2009	3	4
6	Concession duration	Sarmento, 2014; Guasch et al., 2014; Ahadzi and Bowles,2004	3	4
7	Quality of service delivery	Estache et al., 2009; Harris, 2003; Freeman, and Beale, 1992	3	4
8	Competition that provides fair value of the project	Bi and Wang 2011; Public PPP Malaysia, 2009; Ho, 2006	3	4
9	Project finance cost	Grimsey and Lewis, 2005; Freeman, and Beale, 1992	2	9
10	Performance based payment mechanism	Sarmento, 2014; Guasch et al., 2014	2	9
11	Concessionaires profits	Cruz and Marques, 2013a; Estache et al., 2009a	2	9
12	Whole life cost of the contract	Public PPP Malaysia, 2009	1	12
13	Innovation of bidders in the use of output specification	Public PPP Malaysia, 2009	1	12
14	Private sector management expertise and skills	Public PPP Malaysia, 2009	1	12

4.7.1.1 *Impact on Construction Cost*

The transaction costs related to the cost of materials, workforce, machinery and other associated costs including operational expenses associated with the technical, operation and maintenance phases could necessitate renegotiation during the implementation of PPP projects (Reside and Mendoza, 2010). The transaction costs generated at each of the stages of PPP project implementation could have an impact on the cost of construction, cost of operation, maintenance and service costs amongst others (Guasch et a., 2014; Athias and Saussier, 2007). Thus, renegotiation of a contract could occur after contract formation and during the implementation of infrastructure projects up to the end of transfer of the agreement. The occurrence of an event or set of circumstances that result in the adjustment of the contract is termed contract renegotiation (Ho et al., 2015; Xiong and Zhang, 2014). These events or set of circumstances could occur during the stages of implementation of a given PPP project. Transaction costs are generated during the execution of PPP projects.

These transaction costs and their sources could include construction cost, operation & maintenance (O&M) costs, project finance cost, cost of risks transferred, which can have a considerable impact on the respective objectives of the partners (Ho and Tsui, 2009). The literature corroborates these by identifying transaction costs usually incurred during the implementation process of PPP infrastructure projects to include bidding cost, costs of materials and workmanship, cost of risk and project finance cost, contingencies cost, etc. (Engel et al., 2014a; Bitran et al., 2013; Ho and Tsui, 2009). Other transaction costs include the cost of rework, wastes cost, cost of delay in deliveries and work executions. These costs cannot be defined or measured at the time of the formation of the contract. As a result, they are all classified under the cost of construction and associated costs or any other costs.

4.7.1.2 *Impact on the Satisfaction of Road Users*

Studies on renegotiation experiences in Latin America, Portugal, and Spain reveal high incidences of renegotiations, which have adverse impacts on the fees paid by the users in a direct tolling payment mechanism (Sarmento, 2014; Acerete et al., 2010; Baeza and Vassallo, 2010). In these instances, there is a question regarding users' satisfaction because of higher than expected user charges in the form of taxes or toll fees in the case of direct toll roads. As a result, the users' satisfaction is affected by the renegotiation.

A high user charge is evidence of non-achievement of VfM for the public sector. Therefore, the critical issue that requires investigation is how to ensure that the renegotiation does not adversely impact the VfM objectives of the public sector (Acerete et al., 2009). The reason for this is that most renegotiations in PPP projects, especially in the road sector have not delivered satisfactory

VfM for the public-sector users and members of the public (Sarmento, 2014; Acerete et al., 2010). Hence, the need to investigate and assess the impact of renegotiation on the achievement of this identified criteria of VfM in the context of UK PPP road projects.

4.7.1.3 *Impact on the Duration of the Concession Contract*

There is always a time factor in the renegotiation of PPP infrastructure projects. The time required to renegotiate the contract when the need arises in most instances are not in the original agreement. The reason for this may be because the renegotiation of PPP projects in most situations is not envisaged or expected at the time of the signing the contract. Hence, the occurrence of renegotiation can lead to extension or reduction in the duration of the process of construction or concession arrangement (Cruz, and Marques 2013a; Athias and Saussier, 2007). However, in most instances, renegotiation has been found to affect the process of construction through the increase of its duration. However, in most situations, there is increase occasioned by the incidences of renegotiations which has been found to characterise this phase of the PPP project implementation (Guasch et al., 2014; Sarmento, 2014; Baeza and Vassallo, 2010).

Having established that the renegotiation of PPP road projects impacts the construction duration, it is essential to state that there is a direct impact of any changes to the period of the construction stage of the contract duration of the PPP projects. The renegotiation impacts the length of construction with a direct effect on the overall duration of the PPP projects. For instance, an extension of the construction period will directly lead to a change in the defined term of the PPP project. Hence, the length of a PPP road project can be affected by renegotiation. These can be through either decrease or increase in the time required for the implementation of the PPP projects.

4.7.1.4 *Impact on Quality of Service Delivery and Performance of PPP Projects*

The quality and performance of an infrastructure project are essential to the procuring authority initiating the projects (Jefferies et al., 2002). Quality and performance of PPP projects are substantial measures for assessing VfM for the public sector. Renegotiation, as described in the previous sections can also impact the quality and performance. The impact can be reflected in erroneous changes in specification during the technical development of projects (Estache et al., 2009; Harris, 2003; Freeman, and Beale, 1992). The introduction of additional works, changes in standards, changes in design and level of technical expertise and skills of project personnel, which usually lead to the amendment of the contracts all have a way of affecting the quality and performance of PPP road project (Guasch et al.,2014; Sarmento, 2014; Cruz and Marques, 2013a; Bitran et al., 2013).

4.7.1.5 *Impact on the Profit of the Concessionaire*

The profit gained in a concession project is one of the criteria for measuring the achievement of VfM in PPP infrastructure projects. The motive of any business venture or organisation is to maximise its profits and stay in business. Also, the funds invested in the maarket must yield revenue and sufficient returns to the private company for the business organisation to remain in business. The renegotiation of PPP infrastructure projects has also been found to have an impact on the profit of the private concessionaire (Cruz and Marques, 2013a; Estache et al., 2009a). A good example is a case of PPP road projects renegotiation in Portugal, which led to the grant of subsidies as compensation to the concessionaire in the form of subsidies and financial payments (Sarmento, 2014). Corroboratively, the benefit of the renegotiation of transport concessions to the private sector in Latin America are in the literature (Guasch, 2004).

Based on these examples, the renegotiation of PPP infrastructure projects implies the achievement of the profit motives and objectives of the private sector partner. The three possible impacts of the renegotiation of PPP road projects on the profit of the private sector are: increase in profit, a decrease in profit or neither increase nor decrease in the profit defined at the start of the contract (Lohmann and Rotzel 2014; Estache et al., 2009). All these suggest that renegotiation of PPP road projects can affect the profits of the concessionaire either positively or negatively. Also, there may be a neutral effect on the renegotiation of PPP projects (i.e., a situation where the profits remain the same).

4.7.1.6 *Impact on Government Payment to the Special Purpose Vehicle*

In a shadow toll payment arrangement, the government pays the SPV based on the number of vehicles using the road per kilometre instead of the users paying directly for the use of the road (Abdel Aziz, 2007b; Akbiyikli and Eaton, 2005). There are other categories of conditional payments, which include lane availability payment, congestion management payment, safety performance adjustment payment, and lane closure charges amongst others (Akbiyikli et al., 2012; Akbiyikli and Eaton, 2005). The conditions for making these payments are in the contract at the time of formation of the deal. However, events usually occur that necessitate changes to these requirements as stated in the agreement. The modifications occasioned by renegotiation may, therefore, lead to an increase or decrease in government payments on any of the categories identified.

4.7.1.7 *Impact on Revenue*

The increase in transaction costs sources is usual in the delivery of PPP infrastructure road projects (Engel et al., 2014a; Bitran et al., 2013). Other costs can emerge, e.g., costs of rework; wastes cost; cost of delay in deliveries and work executions. For instance, in a direct tolling arrangement, charges are often transferred to the users in the form of user fees. These transfers of the additional costs occasionally lead the users to avoid the roads because of the higher taxes for an affordable and economical road network. As a result, the revenue on the road avoided by the road users will lead to a reduction in the tax generated. Contrastingly, a situation could also arise where there is no increase in the transaction cost (i.e., no additional and extra expenses during implementation), the revenue of the project usually remain positive or neutral.

4.7.1.8 *Efficiency and Credibility of PPP to Deliver Value for Money*

The performance, efficiency, credibility and VfM criteria of PPP concessions are affected by renegotiations (Guasch et al., 2014; Sarmento, 2014). Renegotiation majorly changed the performance and efficiency of PPP road concessions in Portugal (Sarmento, 2014). The impacts of the renegotiation on the performance and efficiency of PPP has generated a high degree of scepticism regarding the ability of PPP to deliver a project based on the VfM criteria described in the contract.

Also, renegotiation primarilly influences the respective objectives of the stakeholders, especially the paramount aim of achieving VfM for the public sector, in PPP road projects (Cruz and Marques, 2013a; Estache et al., 2009). Public P.P.P. (2009) state that the respective spheres of VfM objectives and criteria of the procuring authority, which formed the basis of ascertaining the VfM, achieved during the implementation of PPP infrastructure projects in Malaysia. These included risk transfer between the public and private sectors, whole life costing, use of output specification that fosters innovation, a competition that provides the fair value of the project, performance-based payment mechanism and private sector management expertise and skills.

Therefore, in ascertaining the impacts of renegotiation on VfM criteria, it is pertinent to base the evaluation on the inherent implications on the variables identified in this section of the thesis. Thus, renegotiation tends to affect the VfM objectives of the public client, the profitability of the concession for the private concessionaire and the users' satisfaction, which is the primary objective of the public-sector party in initiating PPP projects. Renegotiation usually impacts the individual goals of the stakeholders, mainly the paramount aim of achieving VfM for the public sector, in PPP road projects (Cruz and Marques, 2013a; Estache et al., 2009).

4.8 CONTRACT MECHANISMS FOR PAYMENT

Payments mechanisms have been structured and designed by the governments and stipulated in the contract to ensure that the PPP contractors are compensated and remunerated appropriately (Abdel Aziz, 2007b). The payments arrangements identify different modalities of payment in PFI projects in the UK, which specifies the terms and conditions upon which payments are to be made to every DBFO contractor. Corroboratively, experience has also shown that the government in British Columbia have used some payment types and mechanisms to achieve individual state specific objectives (Abdel Aziz, 2007b). The government's targets include safety improvements, which fosters the optimisation of road space and availability, increase in road performance and demand, which all represent VfM to the public sector. Essentially, the payment mechanisms can be referred to as mechanisms to ensure the achievement of VfM for the users.

Another study identifies the objective of the government to include the provision of high-quality services to the end user of the facility through increased efficiency of resource allocation, VfM, maximum transfer of risk, resilience, and affordability (Akbiyikli et al., 2012). The statutory requirement of any government is the achievement of VfM and all the objectives depending on the nature of the DBFO contract structure (Debande, 2002). The goals of the procuring authority in public sector investment through private finance have been to achieve VfM for the taxpayer, road users and all members of the public (Sarmento, 2014). Though, the private sector is also expected to have equal benefits and returns for money invested. There should be no compromise regarding the satisfaction of the users in the process of renegotiations. These objectives are pre-requisite for the selection of mechanisms used for payments or compensation to the concessionaire (DeCorla-Souza et al., 2013). Therefore, the payment mechanisms are designed and developed to ensure the achievement of VfM objectives of the procuring authority through evidence of the output specifications (Akbiyikli and Eaton, 2005).

There are various types of payment mechanisms usually adopted for infrastructure projects delivery, especially in the road sector. These arrangements according to the literature are for payment as an essential driver of VfM in transport PPP's since it affects the public and private sector stakeholders regarding the level of satisfaction derived by the end user and the revenue generated by the SPV (Soomro and Zhang, 2013). These mechanisms differ from one DBFO contracts to another and ranges in characteristics depending on the DBFO contract (Abdel Aziz, 2007). Shadow toll payment mechanism, availability payment mechanisms, and active management payment mechanisms are the broad categories of contract mechanisms used for payment to the private concessionaire. The sub-categories of the contract mechanisms for payment are in Figure 4.1.

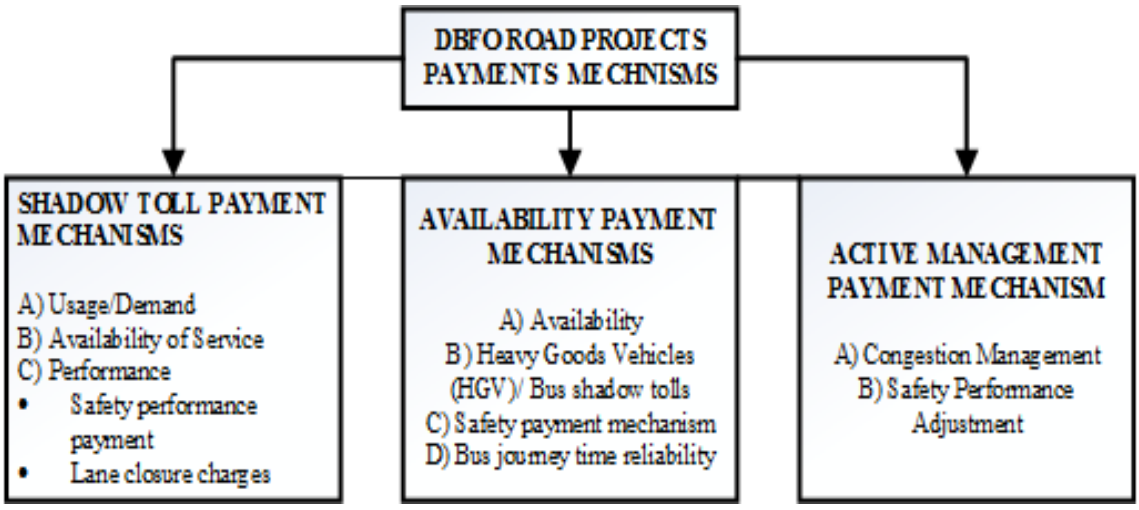


Figure 4.1: PFI (DBFO) Road Projects Payment Mechanisms

Source: Akbiyikli, and Eaton (2005)

4.8.1 Shadow and Direct Toll Payment Mechanisms

In this payment arrangement, the government pays a fee for every vehicle using the road per kilometre instead of the users paying the taxes directly (Abdel Aziz, 2007a). However, an adjustment for a lane closure and safety performance amongst others depending on the requirements of the DBFO contract types. These imply that in a shadow toll mechanism, the users of the road are relieved from the responsibility of paying user charges for the road. Three variants of shadow toll mechanism are demand; availability of service; and performance respectively (Akbiyikli and Eaton, 2005).

Shadow tolls payments are based on usage or demand of the road facility based on the number of vehicles per kilometre of the road. The road available for service can also be the basis of payment to the SPV as payment in this sense relate to the capacity of duty on the road network per time. Performance payments also reflect the safety performance, i.e., improvements schemes to the road network and the personal injury accidents that are avoided by the SPV. Contrastingly, in toll road projects, the users of the road pay the toll fees to the concessionaire company directly. The SPV or concessionaires collect the money directly from the users during the operation of the road at every instance of the road usage.

Furthermore, there are alternative payment mechanisms to shadow and real tolls, which are used in the UK to ensure VfM, though, to varying degrees. These alternative payments arrangements include availability payments, which is the first option to shadow tolls and active management payment mechanisms (Akbiyikli and Eaton 2005).

The procuring authority ensures value for money in shadow toll payment through the government representatives that are responsible for commensurate money with the cost of the project delivered through the defined performance standards adopted as criteria to measure VfM (Takim et al., 2009).

There is also the lane closure charge applied by the governments to the concession contracts as a penalty to the SPV in the event of closure of the road lanes to the users (Akbiyikli et al., 2011; Abdel Aziz, 2007; Akbiyikli et al., 2006). The principle regarding this type of mechanisms is that the government plan to make the road available to the users at all-time and agrees to pay the SPV for the availability. Charges are even paid by the concessionaire for a road closure to the public client as indicated in the contract. These costs of road closure agreed in the concession contract discourage the SPV from closing the road and make the road always available to the users. Thus, VfM is achieved for the road users and members of the public regarding road availability and less road closure on the highways.

Shadow toll is usually adopted in an instance where there can be a straightforward calculation of the vehicle length and traffic band, which are defined by the number of kilometres travelled by each of the vehicles using the road per year (Lewis, 2008). Suitable examples of roads utilising the shadow toll payment-mechanism in the UK include the first eight DBFO road projects (Bain, 2010). The shadow toll arrangements allow the government to use its financial resources and credit support to fund the payments for the use of the road (Tillman, 1998). Hence, users and members of the public are free to use the road without the obligation of paying directly to the facility operator as in the case of a direct toll road.

4.8.2 Availability Payment Mechanisms

Availability payment mechanisms are four distinct types, which include lane availability payments, heavy goods vehicle/bus shadow tolls, safety payment mechanisms, and the government, pays bus journey time reliability (Akbiyikli, and Eaton, 2005). Availability fees to the concessionaire are based on the number of carriageways available for the users (Zlatkovic et al., 2017). These fees are dependent on the time of the day as there are peak and off-peak times with higher payment to the DBFO company for keeping the lanes available during peak times. The purpose of this type of payment mechanism is to ensure the minimum level of disruption to the road users during peak and busy times (Akbiyikli and Eaton, 2005). There is also a tolling charge for heavy goods vehicles (HGV) and public transport to ensure that there is a free flow of traffic on the network for car transportation. The tolling charge is on the availability payment mechanism.

Conclusively, there are journey time-reliability charges, which aimed to ensure that the SPV keeps the lanes available during its hour of operation to foster the reliability of bus journey times for the users (Akbiyikli and Eaton, 2005). All these mechanisms are to ensure that users enjoy the utility intended by the procuring client for the use of the road.

4.8.3 Active Management Payment Mechanisms

Active Management Payment Mechanisms (AMPM) is the second alternative to the shadow toll, which comprises of the congestion management and safety-performance adjustment payment mechanisms (Lawther and Martin, 2014; Abdel Aziz, 2007b). The congestion management encourages the current administration of the road concession project towards ensuring the flow of traffic on the network (Murray, 2012). Congestion management is to reduce congestion on the road network and enhance the free flow of traffic on the highway. The congestion management also ensures that the users can travel on the road network unhindered and within the anticipated and expected travel time. The congestion-management payment mechanism increases the reliability of the journey times of road users. Moreover, an amount of money is usually deducted from the SPV in the event of congestion on the road network to foster reliability of journey time (Akbiyikli, and Eaton, 2005). These imply that a payment is made by the SPV to the client anytime there is congestion on the road network. Hence, this mechanism ensures that there is minimum disruption to the availability of the road during peak periods when demand for the road network has increased.

There is also the Safety-Performance Adjustment (SPA) mechanism used to manage the road network based on the number of personal injury accidents that occur on the project. The SPA is compared objectively with a benchmark, determined from the accident records of a similar set of PFI (DBFO) road projects (Akbiyikli and Eaton, 2005). The purpose of the SPA is to ensure that road there is safety on the road network and the number of injuries sustained because of accidents is to the barest minimum. The client provides the user's satisfaction because of the use of this payment mechanism.

4.9 MEASURES TO ACHIEVE VALUE FOR MONEY AT RENEGOTIATION

Specific measures are identified in the literature that can address PPP renegotiations, which has constituted severe issues in procurement policies and discussions across countries (Guasch et al., 2014; Sarmento, 2014). Mexico and Columbia adopted new law, regulations, and procedures to curb the renegotiation excesses of stakeholders while Peru had to review the existing PPP law and regulations to address constant renegotiations. Portugal created a platform for renegotiation while India evolves a normative package to guide the renegotiation process (Guasch et al., 2014).

Previous studies on VfM in PPP road projects have also succeeded in the examination of this concept in general and specifics as it relates to the individual infrastructure sectors including road projects (Xiong and Zhang, 2014; Montecinos and Saavedra, 2014). Most of these studies have not assessed the impact or influence of the renegotiation on VfM, which is germane and relevant to the contemporary question. To address the presumed issues surrounding the relationship, impact, and outcomes of renegotiation regarding VfM achievement, some of the measures that are taken in these countries to tackle renegotiation (Guasch et al., 2014). These measures are as follows:

First, there should be the stipulation of the renegotiation approach, criteria, and process at the contract formation stage (Guasch et al., 2014). The public sector should also establish a reputation of non-disposal to renegotiation demands through the implementation of the framework for transparency. The increase of the political cost of accepting requests for renegotiation and cancellation of PPP concessions characterised with aggressive and opportunistic bids during the tendering and bidding process could be useful measures for renegotiation (Ho, 2009; Saussier et al., 2009). A panel of qualified and competent experts can also be employed to evaluate aggressive bids, renegotiation request and conflicts resolution for ensuring the achievement of VfM (Marcus et al., 2011; Guasch et al., 2014). However, appropriate conflict resolution mechanisms, vital contractual clauses, and bidding documents should be established for adoption by the panel of experts. Though, new bidding process should be made mandatory for all additional infrastructures and interest rate for PPP financing.

The public sector can also establish a freeze period for renegotiations, e.g., giving allowance to renegotiations between 3 to 5 years of contract award (Grimshaw et al., 2012). A freeze period of renegotiation represents the number of years that the public client places an embargo on renegotiation. During this period, no stakeholder can request renegotiation or initiate a renegotiation proceeding. The establishment of a clear jurisdiction over the decision to renegotiate, e.g., at high levels, such as inter-ministerial committee led by the Minister of Finance could also be of assistance (Guasch et al., 2014). There is also the need for the establishment of risk matrix, which gives detail modalities for identification and allocation of risk with a clause that any modification to the contract during the implementation process should not alter the allocated risk (Guasch et al., 2014). Also, the amendment of the agreement must preserve the net present value (NPV) which should always be zero (Sarmento, 2014; Guasch et al., 2014; Bain, 2010).

Also, appropriate performance bonds on the investment should be imposed on the SPV as a condition for payment. For instance, the contracting parties usually adopt 15% to 25% performance bonds of the total investment. Contingent financing over time is also essential. These according to Guasch et al. (2014) should not be done at the beginning only but throughout the renegotiation process. The establishment of necessary guidelines to ascertain and decide on the appropriate levels of compensation due to the concessionaire will also be of extreme benefits to the stakeholders. Competing measures should be applied on a competitive basis, e.g., award criteria to increase the costs of the contract and make an exit from the agreement more expensive (Guasch et al., 2014).

4.10 SUMMARY OF THE CHAPTER

The principal requirement of PFI (DBFO) road projects in the UK is the achievement of VfM for the public sector, which according to the findings of this chapter has been a significant implementation issue for the stakeholders. The success of the project regarding VfM borders on proper risk transfer, quality of transport product and completion of the project within the specified time. Though, client's satisfaction, project cost, risk transfer, timely delivery and performance of road projects are paramount considerations and criteria when deciding to implement road projects for value for money. However, there is an indication that there is inadequate and non-achievement of all or some of these criteria during the implementation of PPP road projects.

This chapter, therefore, concludes on the need for value for money assessment at the stages of the renegotiation process to ensure that there is the optimum achievement of VfM. Measures that can foster the attainment of VfM and provide the principles for checking the variance between the defined contract specifications and project objectives at the respective implementation phases are desirable and necessary. The uniqueness of this chapter and its relevance to the output of the project encourages the inclusion of the findings in the research instruments shown in Appendix 1 and 2. Summarily, there is an indication that there is a link between PPP renegotiations and value for money.

CHAPTER 5 RESEARCH METHODOLOGY

5.1 INTRODUCTION

The chapter presents the research methodologies, which include qualitative and quantitative research methods that are used to achieve the aim and objectives of the research. The characteristics, peculiarities, and merits of the methodology of the research are highlighted to allow for the selection of the most appropriate method for the study. The examination of all the available methods reveals that there is the need to adopt a mixed method of data collection in the form of an embedded design approach, (i.e. qualitative method integrated within the primary quantitative method to enhance the quantitative result). The embedded design consisted of four main stages that are chosen as described in this chapter. This chapter further shows the logical sequence followed to obtain the data based on the methodology adopted. There is a further explanation regarding the framework and process for the research. The chapter concludes by highlighting the characteristics of the survey respondents, i.e., information relating to the company, experience, and qualification. The information, therefore, forms the basis for linking this chapter to the discussion of the empirical findings of the study in the succeeding sections of this thesis.

5.2 RESEARCH DESIGN

Research is an investigation carried out systematically to establish facts and arrive at new inferences (Naoum, 2012). A systematic, controlled, empirical and critical scientific investigation on propositions about the assumed relationships between and among phenomenon of diverse nature is known as a scientific research (Cohen et al., 2013). Grinnell and Unrau (2005) defined a study as a structured inquiry that utilises acceptable scientific methodology to solve problems and creates new knowledge that is acceptable. A scientific survey that may investigate hypotheses, it may also suggest interpretations of data in a new way and further proffer solutions to the identified problems. In most instances, there is the creation of new frontiers for research exploration in the future (Howarth, 2005). Thus, a research project requires a careful organisation and arrangement of its relevant parts to fit into its whole or main body.

Research design stands to put together, in a concise form, a logical problem, sets of issues or questions (Punch, 2013). Similarly, research design logically and sequentially ensures that there

exists a proper connection between the aim and objectives of a study and the empirical data proposed for collection (Voss et al., 2002). Also, it provides a link between the findings of the data collected with the interpretation inferred from the survey and ultimately to its conclusions (Neuendorf, 2016). Creswell (2009) corroborates this submission by stating that the design of research involves the planning of the procedural sequence of the study to encompass broad decisions and assumptions detailed in the methodology proposed for the collection and analysis of the data. Hence, research is usually characterised by logical sequence and procedure for data collection and analysis.

Yin (2009) describes research design in a logical way and as one, which sequentially provides sequence, which includes connection among the empirical data of research to the aims, objectives and the conclusion of the study. Hence, the problem identified in PPP renegotiation informs the objectives of the research. The literature recognises that the choice of a research design may be premised on the aim and objectives of the research, and research problem (Creswell et al., 2003). As a result, this study adopts the research aim and objectives in the decision-making process regarding the research methodology. This is based on the understanding that the method selected for research needs to be related to the subject area under investigation (Kagel and Roth, 2016). The existing literature indicates that renegotiation has become an issue that has generated interest and found worthy of theoretical and empirical inquiry in PPP infrastructure projects amongst others (Hasselgren et al., 2014).

Existing PPP renegotiation researchers have adopted diverse designs including holistic and embedded research design. The choice of the research methodological approach was by a thorough evaluation and assessment of previous renegotiation studies in PPP infrastructure projects especially in road projects renegotiation. De Brux (2010) discusses case study analysis of two transport projects to assess the facet of renegotiation. Ho and Tsui (2010) also use two case studies to examine transaction costs generated during PPP renegotiation and the appropriateness of PPP for project delivery. Baeza & Vassallo (2010) also adopt case studies on road concessions research in Spain, which is also qualitatively analysed to generate empirical findings. Bi and Wang (2011) discuss based on qualitative and quantitative approach how moral hazard resulted in the loss of provision of surplus social services for the members of the public including the failure of the contracting parties to maximise benefits in PPP project renegotiation. Quantitative analysis was used to evaluate the influence factor of moral hazard in the PPP project renegotiation while qualitative method was adopted to establish the existing relationship between the moral hazard factors. Hence, this justifies that a mixed methods design can be chosen for a renegotiation study in a PPP project environment.

Guasch and Straub (2006) used the theoretical and empirical contributions on contract renegotiation to survey existing evidence on the determinants of infrastructure projects renegotiations. A review of theoretical and empirical research can provide details of experiences and incidences of renegotiation in PPP infrastructure projects across boundaries and countries. Guasch et al. (2008b) also adopt World Bank secondary data to provide information about the analysis of the renegotiation incidences in infrastructure contracts in Latin America and Caribbean countries. Sarmento and Reis (2012) also use literature review and data generated from public documents to discuss how the financial crisis in Portugal has created a unique arbitrage opportunity that provides a solution to the problem of the budgetary constraints of the government. A good example is evidenced in the government of Portugal's spending in the road sector of the economy. Other examples of studies, which adopts the general findings of the literature to develop conclusions on PPP infrastructure projects renegotiation (Engel et al., 2014a, Guasch et al., 2008a). Secondary sources of data, i.e. (government's reports and policy documents, literature on PPP renegotiation, concessionaire's company publication) are all appropriate for application to specific research projects.

There are numerous examples in the literature regarding the conduction of PPP transports projects renegotiation studies using specific case study projects using one or more research methodological approaches (Moore et al., 2014; Bitran et al., 2013; Nikolaidis et al., 2013; Guasch et al., 2008a). Xiong and Zhang, (2014), however, adopt quantitative NPV analysis method to ascertain the present value of gains in consideration of the renegotiation impact in the road sector in Greece. Other previous studies utilise qualitative methods in the form of case studies to evaluate renegotiation of PPP transport projects. Case studies methodology for a renegotiation study in the transport sector is appropriate based on the experiences of these studies.

All these studies provide evidence that most renegotiation research in PPP transport projects are premised on the findings of data collected through the literature and case study results (Domingues and Zlatkovic, 2014). There are also some instances of adoption of quantitative methods especially when there is the need to evaluate and quantify factors and other measurable renegotiation variables. The evidence provided by these studies provide a basis for the distinct survey research approaches and further justifies the choice of mixed methods as more applicable and appropriate for this research. Hence, the succeeding sections provide discussion on the research design adopted for the study and fully elaborate on the how the philosophy of the research is conceptualised and supported including the methodology and methods that are taken to achieve the aim and objectives of the study.

5.3 PERSPECTIVES AND PHILOSOPHY OF THE RESEARCH

Many types of research have attributed different meanings to research mainly from varying but related perspectives. Research philosophy or paradigm is a cluster of beliefs and intellectual perception embraced by individuals, people and the society (Mertens, 2010; Creswell and Clark, 2007). Beliefs and intellectual perceptions are retrospective and guide the actions and the way people view the world (Bryman, 2008; Ponterotto, 2005). It forms a standard model to measure the way and manner of operation of things or events in the world. Corroboratively, Bryman (2008) and Denzin and Lincoln (2005) state that the research philosophy is a cluster of belief which forms part of the human system and dictates what to be studied, how to investigate it and the modalities for the interpretation of the results emanating from the study.

Denzin and Lincoln (2005) opine that an interpretive framework can be adapted to view the world and how the humans work in their immediate environment. Creswell (2007) identifies four research philosophies, i.e. (post-positivism, constructivism, advocacy/participatory and pragmatism), which are conceived and explained as worldviews. These descriptions of research philosophy agree with the submission of the literature (Ryan et al., 2007; Fossey et al., 2002). Also, rhetorical assumptions have also been indicated in the literature as part of the variants of the philosophies of research (Creswell and Clark, 2007). Lincoln and Guba (1994) supports the submission of Creswell by identifying four major research philosophies in qualitative research, which are positivism, post-positivism, critical theory, and constructionism. There is an observation that there is minor difference among the lists of research philosophies in comparison (Creswell and Clark, 2007).

Neuman (2006) broadly conceived methodologies of research while Fossey et al. (2002) identify three principal research paradigms, which are empirical-analytical, interpretive and critical research paradigms. These research philosophies are all regarded as worldviews of research and system of ideas. A school of thought has described the philosophy of research as knowledge claims (Creswell, 2013). Another study identifies different theoretical research perspectives regarding epistemology and methodology, which is in consideration of research theories available for the conduct of the investigation (Crotty, 1998). These works were further revised in a systematic manner in their respective categories of research philosophy, which are ethics or axiology, epistemology, ontology and methodology (Denzin and Lincoln, 2011).

Epistemology implies the theory of knowledge (Crotty, 1998) and ontology are the theory of the existing features or creatures of the world (Benton and Craib, 2010). The methodology can, however, be viewed as the way, manner, procedure, and modalities of studying the world realities, features, creatures, and humans (Denzin and Lincoln, 2011).

Finally, axiology refers to the assumptions, which are usually assigned research values or variables (Denzin and Lincoln, 2011; Creswell and Clark, 2007). Thus, the other literature submissions reveal that study into the philosophy of research has been approached from various views and standpoints namely: positivism and interpretivism (Bell and Bryman, 2007). These two methods are peculiar and have constituted the debate in social science research over the years. Positivism ensures that there is careful observation and measurement of the real-life situations while interpretivism is an approach, which is concerned with how human beings interpret and make sense of reality (Creswell, 2009).

Interpretivism is distinct from positivism from the social scientist point of view. Interpretivism adopts qualitative modalities and approach for the execution of a research study through cultural and historical iterations and interpretations of happenings in the social world. However, quantitative research is more aligned with an approach to positivism. Hence, positivism entails reliable quantitative measurement of the study variables to arrive at straight answers and conclusions, which can be categorically numbered or quantified. Based on these philosophical viewpoints, it, therefore, becomes imperative to agree with the three types of research designs; qualitative, quantitative and mixed methods (Creswell, 2009).

5.4 RESEARCH METHODOLOGY

The approach adopted to execute a research is the primary aspects of the process of research, which helps the researcher to choose the most effective and efficient manner of carrying out the activities required towards providing appropriate answers to the research questions (Bryman, 2008; Bell and Bryman, 2007). The approach to research has also been regarded extensively in the literature as the strategy adopted to implement the objectives of the study (Schofield, 2001). The general orientation of a researcher towards the conduct of investigation has been regarded as the strategy of the research (Bryman, 2008). These imply that the study approach and research strategy connote the same meaning and can be used interchangeably. Denzin and Lincoln (2005) state that the philosophy of a research and the research approach are interrelated as both works harmoniously towards creating the needed working empirical pedestal through appropriate and accurate data collection methods. Hence, research approach is the manner of collecting data to address the objectives of the research towards proper conclusions (Starks, and Brown Trinidad, 2007).

Research Methodology has also been the view from diverse perspectives and distinct from a research design (Baxter and Jack, 2008; Grinnell and Unrau, 2005). Rational and philosophical assumptions, which necessitate the study is research methodology (Dainty, 2008) while research methods are ways, manners, and modalities for the collection or gathering of data and analysing

or processing of the data (Strauss and Corbin, 1998). The design of research is the manner and form in which the study is crafted and organised within an aspect (Creswell, 2013). The principle and procedure of data collection and enquiry based on research questions and objectives can be regarded as the methodology of the research. Research design paves the way for the *"plan"* or *"the procedures"* for a study, which covers decisions about the philosophical and methodological issues about research methods (Creswell, 2009). The preceding descriptions, therefore, indicates that research methods could be qualitative, quantitative, mixed methods, i.e. (combination of both quantitative and qualitative methods).

Therefore, to accurately channel the course of investigation effectively and efficiently, it must follow the appropriate methodology, guidelines for broad assumptions and the application of the right methods to foster the achievement of accurate and incontestable results. It becomes necessary to distinguish between research methodology and research methods in scientific research as opposed to traditional studies. Research methodology is the procedure to follow in the making of an investigation and inquiry for a thorough assessment of the findings leading to the collation of new empirical information. The method adopted for a research study must be one that allows for ease, orderly and proper collection, collation, processing and analysing of the data. The techniques, modalities of data collection, data processing, and analysis methods are all encapsulated within the research methodology adopted and explained in this chapter. There are two main types of research methods, which are qualitative and quantitative research approaches.

5.4.1 Qualitative Research

Qualitative research is a descriptive research type, which seeks to provide an interpretation of contexts and settings towards addressing an issue or idea. The literature has identified qualitative research as interdisciplinary, trans-disciplinary, and sometimes counter-disciplinary, which tend to form a network that interlinks the social and natural sciences (Denzin and Lincoln, 2005). A qualitative research ensures that verbal and textual data are collected, analysed and interpreted to foster uniqueness, complexity, specificity and other traits among which are interpersonal dynamics (Cohen et al., 2011). The research type seeks to explore the opinions, perceptions, views, understandings, and beliefs of others regarding an entity, problem, phenomenon, and the world at large (Fellows and Liu, 2015). The main advantage of this research approach over quantitative research is that it gives room for innovation and flexibility, which affords the opportunity for the research to be carried out within a designed framework (Charmaz, 2006; Creswell, 2003).

The flexibility inherent in qualitative research leads to the emergence of the research process during the execution of the study (Cohen et al., 2011; Kumar, 2011).

The lack of rigidity and threat to validity premised on the inability to ascertain through measurable means the reliability of data in qualitative research makes the process susceptible to change during the collection of data (Patton, 1999). The tendency for the guided or drafted questions to change during the process of data collection including the individual respondents and other research objects make qualitative research unique and different from other methods of conducting research survey (Cohen et al., 2011; Creswell, 2009).

The qualitative researcher develops the research instruments usually through a comprehensive literature review and archive documents and validates the developed instrument (i.e., the guided interview questions) with experts working on the field, industry or academia as appropriate. The researcher thereafter embarks on the collection of data by using the validated instrument (Yarcheski and Mahon, 2007). The qualitative data collection at the advanced stage of the research has been identified as having the possibility of execution through interviews and personal observations, which represents multiple sources of data collection (Yin, 2009). Other secondary documents may be relied upon as means for the collection of data. Though, a single source of data can also be used in qualitative research approach. However, most research adopts the multiple methods of research. Qualitative research does not rely on the subject and object of inquiry alone but also focus on the understanding and interpretation of the actions of humans towards achieving the outputs or products (Benton and Craib, 2001).

The qualitative research approaches in social sciences are mainly based on case studies, interviews, focus group, observations amongst others (Crowe et al., 2011). However, one of the most adopted qualitative research is the interview technique, which assists in the administration of the data collection process (Rubin and Rubin, 2011; McDonald, 2005). The research adopts the interview technique as part of the data collection methods. There are various modes of conducting interviews, which include personal contact with the interviewees and the investigator or researcher, telephone interview or video conferencing via Skype and other means are sufficient ways to carry out interviews in social science research. The three main categories of interviews include:

- Personal Interview: This is an interview, which requires close working between the interviewer and the interviewee. In this type, there is direct contact with the respondents, which can promote proper interaction, dialogue, and rapport within the work or closed environment.
- Telephone interview: This type of interview is fast and ensures rapid, quick and economical collection of data. It eliminates the cost of travelling and arrangement of appropriate video conferencing facilities.

- Video Conferencing: This is more convenient than the personal interview. However, it has attendant cost; it allows data collection from a distance.

The first two techniques, i.e., personal and the telephone interviews were adopted for the study as both methods provide the opportunity to be actively engaged with the respondents including the chance to ask questions on any technical issue, which may arise in the process. It further assists in securing the audience of respondents at a very convenient time outside busy work period on the telephone. Finally, this interview method seeks to assists in seeking opinions on emerging issues from the initial structured list of questions.

This research adopts the semi-structured interview technique of case study data collection from the available arrays of case study methods of data collection. Interviews are used as a flexible tool of research employed for collecting data, which encompasses verbal, non-verbal, spoken and hearing sensory channels of communication (Cohen et al., 2013). The interviews bring the interviewer (the person administering the interviews) and the interviewee together in an exchange of views, information or discussion of the topic of joint and mutual interest towards the giving and collection of data (Kvale, 2006; Kvale, 1996). Cohen et al. (2013) corroborate this by stating that interviews fosters participation of an individual or a group of persons in the discussion of issues and provide their interpretation of the world they live including problems or situations affecting the world from their point of view.

Various types of interviews have been identified from the literature, which includes standardised interview, in-depth interview, elite interview, life history interview, ethnographic interview and focuses group interview (LeCompte and Presissle, 1993). Semi-structured and group interview was established in the literature (Bodgan and Biklen, 1992) including a structured interview (Lincoln and Guba, 1992) and exploratory interview (Oppenheim, 1997). The reason for these different types of discussions is to ensure that respondents are open to diverse approach to eliciting information to suit the research (Mishler, 1991). These interview types can also be used concurrently to secure the advantage inherent in their use, which is to assist in ensuring that the limitation of one is removed and addressed by the other especially in a situation where one type seems inappropriate in a case. It is on this basis that a semi-structured interview technique was adopted in this study to allow for the advantages of both structured and unstructured interviews.

Cohen et al. (2011) however, indicate four types of interviews namely structured, unstructured, non-directive and focused discussions. Interviews should be conducted to collect comprehensive and quality data, which can address the research questions. The quality of data collected during an interview is dependent on the experience of the interviewee and the level of interaction with the interviewee including the skills and commitment of the interviewer (Kumar, 2005).

Most interviews are structured or unstructured depending on the type and nature of research. Cohen et al. (2011) give the distinction between structured and unstructured interviews in Table 5.1.

Table 5.1: Distinction Between a Structured and Unstructured Interview

S/N	Structured Interview	Unstructured Interview
1	Quantitative Approach	Qualitative Approach
2	Numbers	Words
3	Predetermined, given	Open ended, responsive
4	Measuring	Capturing uniqueness
5	Short term, intermittent	Long term, continuous
6	Comparing	Capturing particularity
7	Correlating	Valuing Quality
8	Frequencies	Individuality
9	Formality	Informality
10	Looking at	Looking for
11	Regularities	Uniqueness
12	Description	Explanation
13	Objective facts	Subjective facts
14	Describing	Interpreting
15	Looking in from the outside	Looking from the inside
16	Statistical	Ethnographic, illuminative

Source: Cohen et al. (2011)

Summarily, the process of qualitative research entails the development of questions and procedure to execute a study for collection of an inductive analysis based on the building of general theme and developing interpretations and argument to establish the meaning of the data (Creswell and Poth, 2016; Creswell and Clark, 2007). This meaning could be subjective and could result in the understanding and interpretation of actions of human and the product they deal with on a day-to-day basis (Creswell, 2007). Thus, the investigation of PPP road project renegotiation is understood to apply to this approach of research as it seeks to unravel the behaviour of the stakeholders regarding the reasons for initiating renegotiations, the outcomes of the renegotiation and the impacts of the renegotiation on VfM as stated in the research questions. All these represent variables defining the nature of the product (i.e., road projects).

5.4.2 Quantitative Research

Quantitative research is a type of investigation, which is usually conducted to test theories objectively. The relationships existing between variables are examined and measured on instruments for analysis (Creswell, 2013). The quantitative research is an appropriate method of gathering data based on geographical area or locations. The data could be substantial or of a sizeable number with minimum cost. Hence, quantitative research concerns the measurement, generalisation, causality, and repeatability, to ascertain the degree of difference between a circumstance, situation, event or issue and more appropriately to determine or quantify the extent

of variation in a problem, issue, phenomenon or condition (Bryman and Bell, 2015). Thus, quantitative research is a type of investigation conducted in a case where there is a need for measurability or quantification of the study variables. Moreover, quantitative analysis enables data, which can be quantified and analysed using appropriate statistical tools to be collected from the respondents (Lewin, 2005).

The quantitative method of research has also been found to help in adhering to strict research design defined from inception. It also employs quantitative measurement and eases the use of numeric statistics in the research (Scott et al., 2003). Thus, quantitative research is particularly relevant to this study as it provides the necessary tool to measure and quantify the factors leading to renegotiation in PPP road projects including other measurable and quantifiable data within the confine of the research objectives. It may be impossible to achieve this sphere with the use of qualitative research approach. The most common quantitative research is a questionnaire survey (Bryman and Bell, 2015).

Questionnaire surveys are usually in the form of mail; group administered questionnaires and household drop-off (Bowling, 2005). The mail survey adopts the use of postage stamp to deliver the questionnaire for the study to the identified potential respondents' addresses. It helps the researcher to send the same questionnaire to categories of people or population at a low cost and ease. Though, this method allows respondent to provide answers to the questions at a convenient time, however, the response rate has been found to be low due to lack of prompt or persuasion that other methods afford. Hence, consideration is not usually given to this approach as the best approach to questionnaire administration.

The one to one administration of questionnaires affords the researcher the opportunity of meeting the identified respondents in their respective homes, offices or place of business with the research instruments to elicit information about the research objectives. The collection of the data usually takes place after completion in private or at a convenient time (Blair et al., 2013). The method is advantageous as it allows for personal contact with the respondent and fosters interaction between the administrator and the respondent. However, the group administered questionnaire seek to devise avenue where members of a group, organisation or establishments are brought together to facilitate the conduction of survey administration drafted in the form of structured questions, particularly on those who are present and have sound knowledge of the subject (Bryman, 2003). Group questionnaire can be administered online, at professional meetings, at head or branch offices of companies and organisations. Thus, there is evidence of convenience in the administration as well opportunity to answer any unclear questions, which may be asked by the respondents. Usually, there is evidence of high response rate from the group administered approach than the initial methods of quantitative data collection.

Questionnaires can be developed into four main measurement scales, which include nominal, ordinal, interval and ratio scales (Haughton and Stevens, 2010). Scales are used in social science research for capturing the direction, level, and intensity of the research variable regarding construct, accuracy level, data simplification, coverage strength and the basis for comparison amongst data (Neuman, 2006). There are other types of scale, which are Thurstone scale, the Bogardus, Guttman scale, semantic differential scale and social distance scale including the Likert scale (Chimi and Russell, 2009; Miller and Salkind, 2002). In addition, the literature identifies three methods of designing a questionnaire survey, which includes unstructured, structured and semi-structured questionnaires (Gillham, 2008, Schensul et al., 1999). However, the appropriateness and merits of the structured questionnaire over other methods lead to its adoption in this research (Clark-Carter, 1998). The benefits inherent in the adoption of the structured questionnaire, according to Clark-Carter (1998) include:

- A range of possible answers included as part of the questions in a questionnaire fosters clarity of purpose and appropriateness of respondent's answers.
- The questions are characterised by precise words, which are usually in a fixed order eliciting response in the defined order.
- Respondents have the options of completing the questionnaire and returning it either to post or online. This enhances optimal utilisation of the researcher's time and energy.
- It ensures standard format in the presentation and asking the questions.
- It improves quick and immediate quantification of the data collected, e.g., through the 5-point Likert scale questions, which allows the allotment of scale 1-5 for alternative answers.

5.4.2.1 *Identification of Population*

The population for this research are the public and private sectors stakeholders involved in PFI (DBFO) road projects in the UK. The renegotiation of PFI (DBFO) road projects in the UK has been found to be between the public and private sector stakeholders. Though, there is usually the measurement of a population by the general census of that population. However, the research aims to collect data from a sample of the required people. Hence, the study only sampled the public and private stakeholders in UK DBFO road projects based on the understanding that they are the primary stakeholders involved in the renegotiation.

5.4.2.2 *Sampling Unit and Strategy*

Practitioners engaged in PFI (DBFO) road projects (i.e., public and private sectors) in the UK constitute the sampling unit for this research. Since all these practitioners are not a party to renegotiation of PFI (DBFO) road projects, the study seeks to collect data from the primary

stakeholders. The reason for this is to ensure that the data obtained from the sample population provides a perfect representation of the study population including relevant features of the population in their proportions as argued in the literature (Blaikie, 2009). All the PFI (DBFO) road projects in the UK are the projects considered for the execution of this research (See Table 2.4). No data on the two DBFO projects in Northern Ireland as the public entity indicated at the onset that the current workload makes it practically impossible for participation in the study. Information regarding the lists of respondent's organisations is available through PPI Database, 2016, relevant literatures the website of the procuring authorities and private organisations. The contact persons from these organisations assisted in providing the e-mails and phone numbers of appropriate members of staff required for the data collection exercise.

The strategy adopted in the sampling of the population agree with the recommendation of Blaikie (2000), which states that data for a specific research study can be obtained from several individuals or units of a population, whole population of an investigation, or selecting the entire sample of the element of a sampling unit as the sampling frame. In this study, the total population of PFI (DBFO) road projects in the UK as shown in Table 2.4 serves as the sampling frame for both interviews and questionnaire survey, which are public and private sector representatives from the 34 DBFO road projects. Therefore, only stakeholders from 22 PFI (DBFO) road projects initiated by the Central authorities in England, Scotland and Wales could be reached through the online questionnaire based on available contact details. DBFO road projects undertaken by the procuring entities of the local authorities and Transport for London were not considered as they majorly involve minor highways maintenance, building maintenance and electricity projects. The total population (44) stakeholders in public and private sector were selected for the questionnaire survey to achieve a wide range of responses on the renegotiation of PFI (DBFO) road projects across the UK. Respondents from all the PFI (DBFO) road projects were found operating in public and private organisations in England, Scotland, Northern Ireland and Wales including Local Authorities, and Transport for London.

5.4.2.3 *The Use of Likert Scale in the Questionnaire*

This research, however, adopts the Likert scale for the data collected. For instance, the research questionnaire requests the respondents to identify and rank based on a scale 1-5 the factors leading to the renegotiation of PPP road projects. Likert scale was used to rank factors, evaluate measures amongst others in the questionnaire. The Likert scale has been known to have a high degree of reliability and viability, which allows ranking of the respondent's information (Bontis, 1998). A very high reliability of between 0.85 and 0.94 is considered very high in Likert scale, which was adopted in this research (Dittner et al., 2004, Kopec et al., 1995).

Moreover, the five-point Likert scale can meet the needs of researchers, and that is why it is popularly known and adopted. Ordinal questions, which are also on 5 points Likert scale, are used. Therefore, a combination of the nominal and ordinal level is chosen.

Nominal questions elicit answers that border on counting such as questions bordering on the number of years of experience of the respondents and the type of PPP stakeholder and number of staffs in the organisation of the respondents. Contrastingly, ordinal questions are on a 5-Level Likert scale, which is commonly used as a quantitative research method because it allows respondents to choose from a wide range of several degrees of possible answers available regarding a statement. The 5-point Likert scale provides balanced response options, which are based on equal positives and negative scales including eliciting opinions from respondents with fewer choices to make meaning out of the number of response categories (Losby and Wetmore, 2012). Thus, the Likert scale makes researchers have essential meeting needs. Moreover, there are varying types of scales that should be remembered among which the five-point scale was adopted in this study. This Likert scale has five-level, which are stated as follows: Strongly Agree (5), Agree (4), Indifferent (3), Disagree (2), Strongly Disagree (1). 5 & 4 are the two positive numbers while 2 and 1 are the negative numbers.

The Likert scale of 5 fosters the classification of the criticalities of the factors, impacts, outcomes, and measures to ensure VfM at renegotiation. The respondents identified the degree of criticality of each of the factors on a scale of 5 to 1. Scale 5 stands for strongly agree, scale four stands for agree, scale three stands for indifferent, scale 2 implies disagree, scale one indicates strongly disagree. According to (Thiagarajan and Zairi, 1998), the factors that a researcher feels critical are essential when rating a group of factors to ascertain their respective level of importance.

The use of Likert scale type 1 to 5 ensures that the respondents indicate their agreement with the factor, impact, and measures amongst others separate categories of questions stated in the questionnaire within the confine of the scale. A practical and tested method of ascertaining the criticality levels of the factors, impacts, and measures is to adopt the methods identified in the literature by evaluating the mean values or percentages to decide the degree and level of criticality. Consideration can, therefore, be given to the mean values or the percentages as a score out of the maximum score expected from the responses. This maximum rating, which is based on the maximum Likert scale obtainable in the instance of the questionnaire designed is 5.

The scale five is chosen because it is considered appropriate and convenient to work with as well as the ease it affords in facilitating accurate statistical calculation and conversion through the estimation of the mean values of the respective individual nodes and variable. The classification of the criticalities of the factors, impacts, outcomes, and measures to ensure VfM at renegotiation are evaluated after analysis.

Each is based on their criticalities level, which may either be represented as follows: very critical, critical, moderately critical and non-critical. Thus, the critical levels of the factors leading to the renegotiation are identified after careful analysis and evaluation in any of the criticality categories.

5.4.2.4 *Ethical Practices and Administration of Questionnaire*

There were deliberate efforts in the administration of the questionnaire for the collection of data. The introductory letter indicates the purpose of the questionnaire survey while the adoption of ethical principles such as administration of questionnaire and conduction of interviews within the confine of the approval as shown in Appendix 6. The strict adherence to the terms of the ethical approval contributes to the quality of the work and ensures the confidentiality and privacy of the information provided by the respondents. Bias was drastically reduced using prompts and straightforward questions during the interviews and by ensuring that only respondents working on PFI (DBFO) road projects offered answers to the research instruments. The respondents are not aware of one another's opinions, and there was no collusion by the respondents. Ethical standards were followed in the administration and collection of data as agreed during the submission of the research proposal for consideration by the ethics committee. There was no conspiracy between the respondents as all the responses given were individually provided by each of the respondents in such a way that none of the respondents has access to one another during the data collection process. Though, the data collected was small. However, it reflects the exact position of relevant stakeholders that are required to provide information regarding the renegotiation experiences in PFI (DBFO) road projects in the UK. The researcher maintains a high level of integrity by working with the sample population during the data collection while also ensuring that there is the analysis of the data collected without the distortion of facts and figures.

The final questionnaire emanating from the second pilot study was administered to further test the research questions towards the development of a framework for VfM renegotiation. The understanding was premise on the fact that the successful execution of the stage would afford the opportunity for robust findings on the objectives of the research, which would verify and complement the conclusions of the interviews.

The questionnaire survey was designed to address the research objectives and categorised into sections and six main headings. These involve the assessment and evaluation of the following: respondents; project specific renegotiation characteristics; factors leading to renegotiation; impacts of the renegotiation on VfM criteria; outcomes of the renegotiation, including remedial actions to ensure VfM through appropriate VfM measures (See Appendix 3).

The robustness of the data collected at this stage can be justified, based upon the administration of questionnaires on respondents, which cuts across some of the UK PFI (DBFO) road projects as indicated in Table 2.4. Although, DBFO projects involving local authorities and transport for London are excluded from the list of investigated projects because most of the projects are mainly maintenance and telecommunications contracts (Mackie, 2005). Thus, the total UK PFI (DBFO) road projects where questionnaires were administered to both the public and private stakeholders totals twenty-two (22). Responses were received from the stakeholders working on these projects in the UK.

The client and SPV on each of the PFI (DBFO) road projects asked to participate in the completion of the questionnaire. The reason for this is based on the understanding gained during the first pilot study that the stakeholders involved in the renegotiation of PFI (DBFO) road projects are the client and the SPV. Therefore, the total number of questionnaires administered on both public and private sector stakeholder on each of the projects identified is forty-one (41) as three respondents declined to participate in the study at this stage of the research. The respondents that provided information are the primary parties to the renegotiation of the privately financed road projects in the UK (See Table 2.4).

5.4.2.5 *Questionnaire Data Analysis*

The research questions guided and informed the selection of this statistical analysis technique and test. The descriptive statistics and the reliability and validity test conducted on the data collected, coincided with the views of the supporting literature (Coakes and Steed, 2009; Bryman and Cramer, 2005). The descriptive statistics set out in detail the respective answers, frequencies, percentages and mean response analysis of each of the questions outlined in the individual sections of the questionnaire.

The variables, regarding respondent's information, were presented as explained in Sub-section 5.6.3.1 of this thesis. The findings from these sources, i.e. (the case study projects sampled) are used to draw relationships, transparently, between and amongst the variables, items and sections of the questionnaires.

The questionnaire was analysed using the descriptive method of analysis, which includes frequency and tabulation and mean statistical techniques for comparison purpose. Also, Analysis of Variance (ANOVA) in the one-way format was carried out to ascertain the significant level of the data collected, while Cronbach's Alpha values were calculated to evaluate the reliability and validity of the responses provided by the respondents.

- Descriptive Statistics

The frequency of all the variables is measured and ranked in their respective decreasing order of importance, which shows the distribution of the frequencies across the sections of the questionnaire. Pallant (2010) indicates that descriptive statistics could be presented using frequency distribution and cross tabulation. The research objectives and the nature of the data collected guide the selection of the descriptive statistics. Thus, it became clear that it would be more appropriate to analyse the data using the descriptive method of analysis, especially due to the few numbers of responses received.

- Frequency Distribution and Tabulation of Results

The SPSS software analysed the questionnaire by providing the results of several survey variables through the outputs printed after the execution of the command. The results, shown on the frequencies of the variables are presented in tabulation to indicate the respective percentages, mean values etc., of the factors impacts and others. The frequency distribution is regarded as a method involving the calculation of the frequency distribution of the data collected and the incorporation of the dataset in table format (Pickard, 2008). Simple frequency tables or a series of charts can be adopted to describe the cases characteristics by ascribing numerical values to each case (Pallant, 2010). The frequency of the number of responses provided to a question in a questionnaire is in a tabular form, as well as the percentage of the number of answers given by the respective respondents (Haughton and Stevens, 2010). Clearly, the distribution of numbers and percentages is essential and usually presented in tables as part of the activities required for the analysis of the data.

Tables are also crucial as they show whether there is a difference between one variable of the research to the other. In tabulation, it may be necessary to cross-tabulate the results obtained from the questionnaire survey. Cross-tabulation merely involves the presentation of the data from one or more variables in a single table, to foster the identification of similarities and differences and to compare one variable to another (Haughton and Stevens, 2010, 2000).

Cross-tabulations as shown in this chapter of this thesis to ensure that the inherent differences between the numbers, mean values and percentages are explained, and the readers, including the researcher, can vividly observe the links and connectivity between the variables indicated in the tables (Haughton and Stevens, 2010; Pickard, 2013). These frequencies, means and their respective percentages, as stated in the tabulated results, show the values of the factors, impacts, outcomes and measures respectively.

5.4.3 Mixed Methods

Creswell (2003) study on methods of research leads to the discovery of the use of mixed methods as a remedy of the shortcomings and deficiencies inherent in the use of one method of research over the other, i.e. (either quantitative or qualitative) method. The mixed methods of research, therefore, adopt the quantitative and qualitative methods of research in varying ways and manner. Plano Clark et al. (2008) attest to these by identifying the various standard techniques that are available for the design of mixed methods research. Thus, mixed methods research provides an opportunity to combine qualitative and quantitative methods to foster the collection and analysis of survey information through four top mixed methods of research design as shown in Figure 5.1.

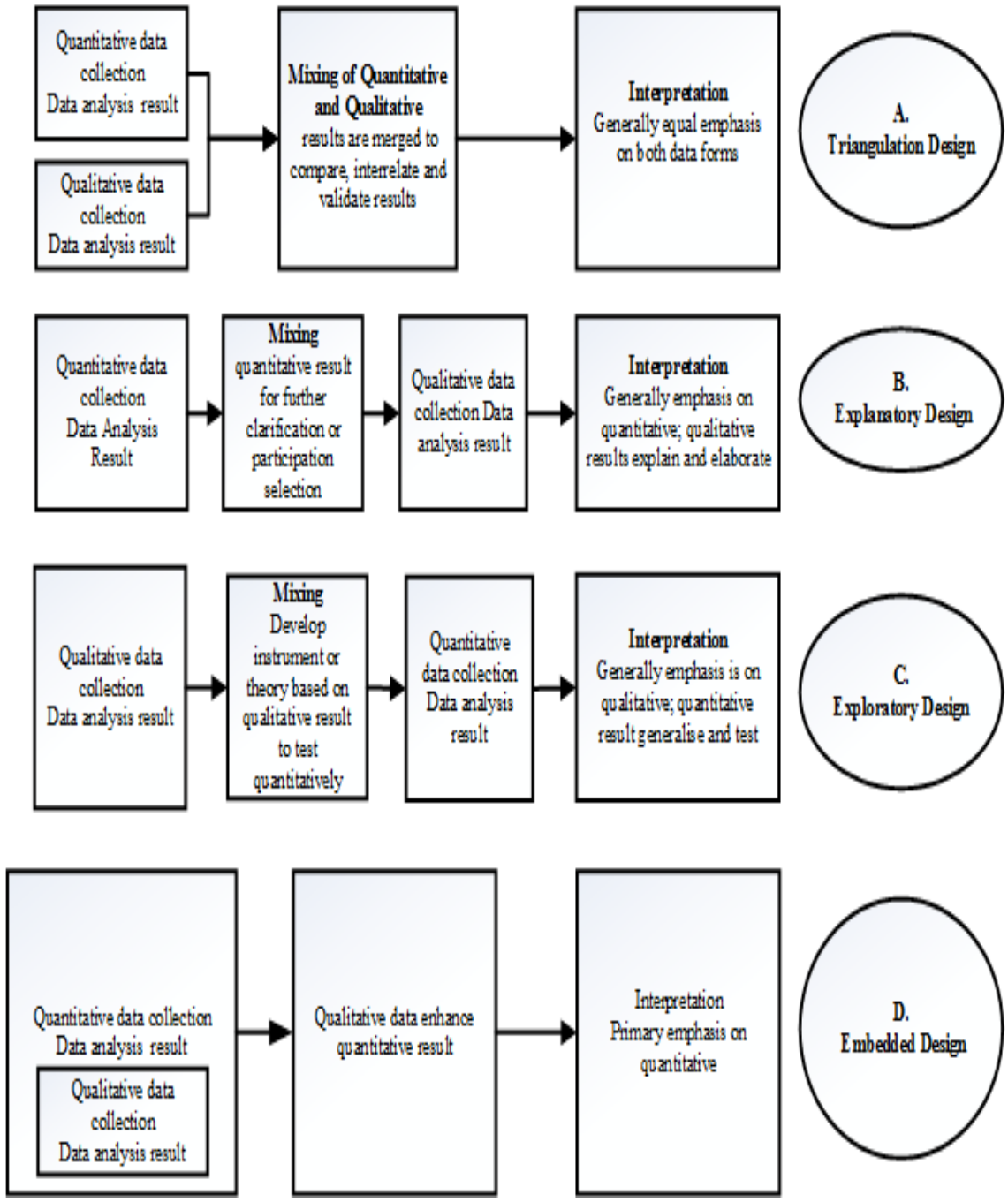


Figure 5.1: Mixed Method Designs

Source: (Plano Clark et al., 2008)

Based on Figure 5.1, mixed methods research can be designed for implementation through either triangulation, explanatory, exploratory and embedded forms. Plano Clark et al. (2008) by identifying the use of mixed methods research in a sequential way to elaborate the findings of one method of study with the use of another research method. Creswell and Poth (2016) further opine there can be the concurrent use of quantitative and qualitative data as well as a transformative use of the lens of the available theories established in the literature to generate a framework for a research design that encompasses both quantitative and qualitative data collection. Thus, mixed methods of research help to extend the frontier of one method to another method through the mixing of their attributes and characteristics to determine the crest of the research based on the continuity between the two ends of research (Creswell, 2003).

Therefore, a researcher must decide, which of the research methods is more applicable in each situation and circumstances by keeping in view the research problem, the personal experiences of the researcher and the intended audience when choosing a research approach (Creswell, 2003). The research aim established in chapter 1 of this thesis (Please refer to section 1.4) is specifically targeted at *"integrating considerations of VfM into the renegotiation of PPP road projects."* Two concepts are proposed for investigation in this research, and one is a subset of the other, i.e., VfM is in context a dependent research variable, which is open to broad possibilities of outcomes based on the process and effectiveness of renegotiation of PPP road projects. Hence, the investigation of these conceptual variables requires a real-life situation research in a working environment and setting capable of eliciting practical answers, which is unbiased and realistic.

5.5 CHOICE OF RESEARCH METHODOLOGY

The explanation of the several philosophical assumptions and approaches in the preceding section provides an overview of the available methods for the implementation of this research. Also, less research on renegotiation in the UK informs the choice of mixed methods. The need for a proper choice of a research approach cannot be over-emphasise in the achievement of the aims and objectives of the research. A sound research approach is aimed at eliciting the best possible manner of executing the research and answering the emerging research questions (Blaikie, 2000). The understanding of the author of the numerous available research methods identified was that mixed methods seem better fitting to address the aim and objectives outlined in section 1.4 of this thesis. The reason for this understanding was in consideration of the peculiarities and differences observed in the research objectives.

A mixed method as previously described adopts both qualitative and quantitative methods of research. Therefore, it is expedient and necessary to explore the opinions and views of the relevant stakeholders of PFI (DBFO) road projects in the UK, which has been identified as having long history of adoption and high or extensive knowledge gap (Makovsek et al., 2015). The adoption of mixed methods was also understood to gain first-hand information and understanding of renegotiation with regards to the achievement of VfM. Verbal and textual data emanating from the qualitative method of data collection ensures unique information that was attributed to the respective case studies. On the other hand, quantitative research method was found useful in the execution of objectives 3, 4, and 5.

Based on the practicalities of this qualitative and quantitative techniques, which benefit the implementation of the research objectives, the execution of the research is appropriate in both interpretivism and positivism philosophical spheres. The study was designed in such a way as to allow qualitative method through interviews to assist and enhance the quantitative method. The research instruments are developed from the literature and qualitatively refined towards the design of a questionnaire adopted for the advanced stage of data collection. Discussion of findings of the research is premised on the interpretation of the data collected through the quantitative method (i.e., questionnaire).

The reason for adopting the quantitative methodology as the sole method for generating most of the answers leading to framework development was because the results of the literature review and the case study interviews were used in the design of the questionnaire, which represents an instrument of a quantitative methodology. The design of the study, therefore, allowed qualitative method through interviews to assist and enhance the quantitative approach. Thus, the conclusion regarding the choice of design for the research is based on the adoption of epistemology and axiology philosophies as identified by Crotty (1998) and supported by Denzin and Lincoln (2011).

The adoption of the epistemology and axiology philosophies is regarded as mixed methods, which seek to ensure that the limitation of adopting only one technique is removed and replaced with a feasible and legitimate alternative to both methods of data collection (Doyle et al., 2009). The mixed method approach also affords theoretical and practical merits, which makes its application justifiable in terms of vigorousness and thoroughness of the data collection method (Plano Clark et al., 2008; Creswell and Clark, 2007). The choice of research design and method are premised on the variables of the study, i.e., axiological assumption (Denzin and Lincoln, 2011).

The aim, objectives, and research problem including the relationship between the research variables and related empirical studies constitute the considerations in the choice of a research design and method. There are the identification and assessment of previous renegotiation studies in PPP transport projects and their respective methodologies. These earlier studies serve to premise the methods and design of this study research based on the methods adopted for the execution of the previous renegotiation studies.

First, Brux (2010) apply case study analysis of two transport projects to assess the positive and negative sides of renegotiation, which depicts qualitative analysis methodology. On the other hand, Guasch et al. (2008) use original data set from World Bank database attributed to 307 concessions awarded in Latin America from 1989 to 2000. These infrastructure concessions cover data collected in both water and transport sector, which are used in the analysis towards ascertaining the determinants of high incidence of renegotiations of infrastructure contracts. Furthermore, Sarmento & Reis (2013) uses literature review and data generated from public documents to discuss how the financial crisis in Portugal has created a unique arbitrage opportunity that provides a solution to the problem of budgetary constraint of government. This study reflects government spending in the road sector.

Sarmento & Renneboog (2014b) address the process of conducting renegotiation in transports projects with the aid of two case studies on bridge construction and railway infrastructure in Portugal (i.e. Fertagus and Lusoponte) after careful literature review on PPP renegotiation. Similarly, previous studies adopt methods in the form of case studies to evaluates renegotiation of PPP transport projects after having extensively reviewed the literatures relevant to the survey (Engel et al., 2014; Domingues & Zlatkovic, 2014; De Brux et al., 2011; Blank, et al., 2009; Athias & Nunez, 2007). All these studies provide evidence that most renegotiation research in PPP transport projects are premised on the findings of data collected from case studies either by document analysis of secondary data or interviews, which are then qualitatively analysed using the appropriate techniques (Domingues & Zlatkovic, 2014; De Brux et al., 2011; Blank, et al., 2009). These literatures provide a basis for the distinct survey research approaches and justifies the choice of mixed methods as more applicable and appropriate for this research.

All the previous studies identified adopt the literature and interviews for the execution of the research. However, Beuve et al. (2014) illustrate the use of quantitative analysis in a PPP renegotiation study by developing a quantitative compensation model to estimate future cash flows using descriptive statistics, which evaluates the renegotiation percentages and means values.

The quantitative methodology adopted also assist in the estimation of future traffic demand and the operation and maintenance costs, which are both critical stochastic variables of the study. A mixed-method is, therefore, feasible for adoption in this study. The reason for the utilisation of this method is to ensure that the limitation of utilising only one technique is removed and replaced with a viable alternative (Doyle et al., 2009). Also, the mixed methods approach was adopted because it offers theoretical and practical merits as suggested by these studies (Creswell and Clark, 2007).

The merits include the opportunity to use two methods (i.e., quantitative and qualitative) to gain a thorough understanding of the research problems. It affords the opportunity for the researcher to respond to the needs of more than one perspective regarding varying interest and needs while further providing comprehensive, precise and accurate outcomes, which ensure framework development. A mixed methodology assisted the conduction of both qualitative and quantitative research surveys based on the objectives of the research as stated in Chapter 1 of this thesis, i.e., a combination of interviews and questionnaires of professionals involved in UK PFI (DBFO) road projects is used in the study to achieve the objectives as shown in Figure 5.2.

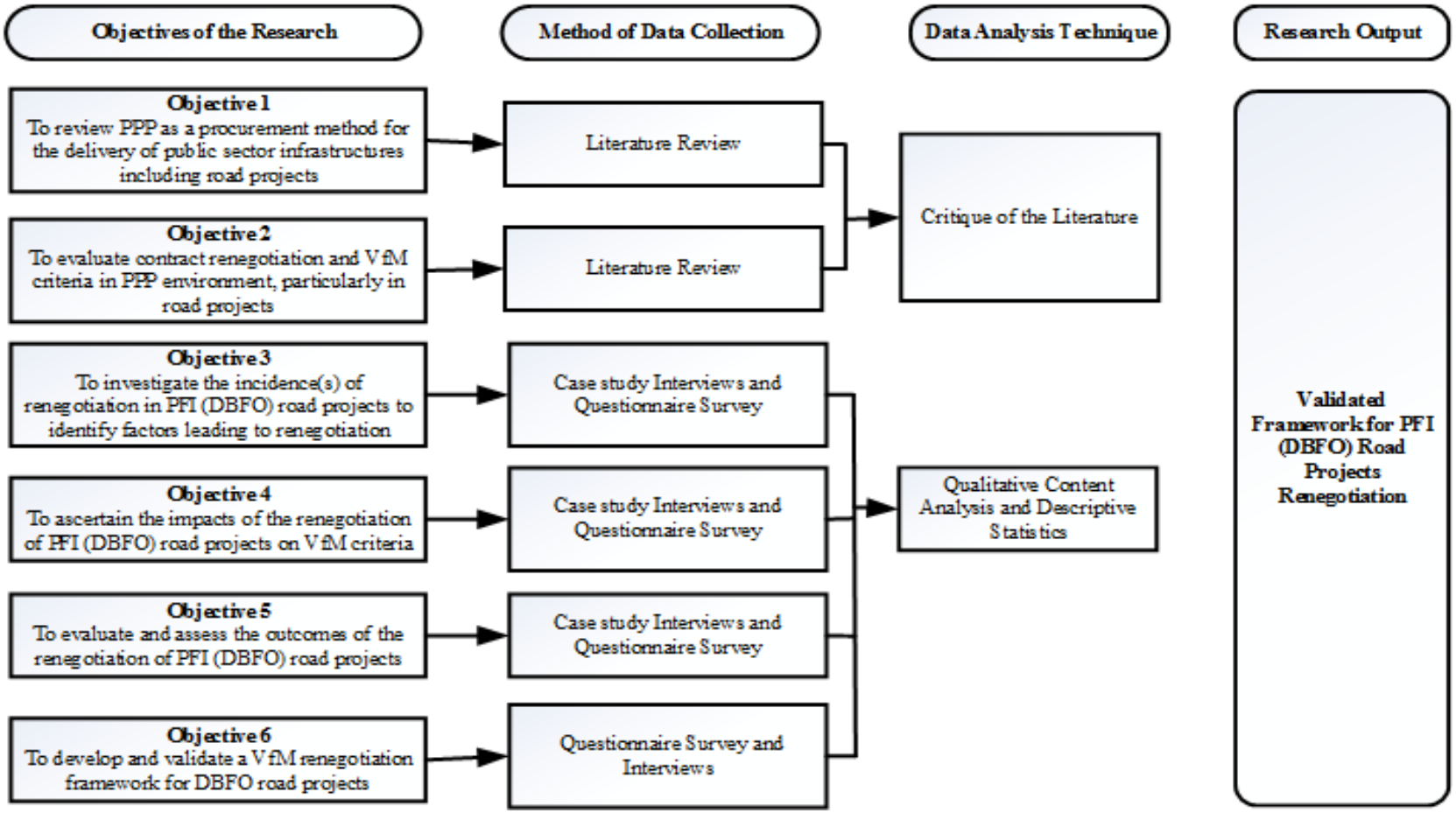


Figure 5.2: Methodology Adopted to Achieve the Individual Objective

As shown in Figure 5.2, case study interviews and questionnaires relevant to the investigation and the observed population of the survey are used to achieve the research objectives. The critique of the literature, content analysis of the qualitative data and the use of descriptive statistics to analyse the quantitative data collected lead to results that assist in the development of the framework. There is the validation of the developed framework through the interviews of potential users in the UK public and private sectors.

Since research is multifaceted and requires proper and thorough execution of its respective process, the use of the mixed method is considered fitting for this research as it provides further insight and different perspectives concerning the renegotiation and VfM towards the development and validation of a sound framework. The merits obtainable from the exploration of the study justify the choice of a mixed method. The mixed method provides an avenue for a comprehensive collection of the data spanning the breadth and width of renegotiation in PPP road projects as well as issues surrounding VfM. Also, quantitative method of research will help in adhering to strict research design defined from inception, which aids the employment of quantitative measurement and eases the use of mathematical statistics. These assisted in measuring the factors influencing renegotiation and other measurable data. Conversely, the qualitative research is a methodological principle based on social interactions, which allows data collection from respondents based on the reality and experience of each case.

5.5.1 Operationalisation of the Mixed Method of Research Approach

Research implies the collection and analysis of primary data through the adoption of methodologies considered appropriate and aligned to the research objectives. The mixed methods of research use the embedded design approach as shown in Figure 5.1 because of its suitability and relevance to the objectives of the study. Also, it affords the opportunity of combining both methods for the collection of data on PPP road projects in the UK. Since mixed methodology approach involves the use of both qualitative and quantitative methods, the qualitative method seeks to unravel information to improve the theoretical knowledge of renegotiation within the PFI (DBFO) road projects domain in the UK. However, the quantitative method aims to generate quantitative values based on the established variables from the literature and case studies within the same research population. The examination of the available methodologies leads to the choice of mixed methods approach to resolving the identified research questions.

A qualitative method is needed to evaluate the incidences of renegotiation in the selected cases of UK PPP road projects. The literature, case studies, and analysis of the selected instances of renegotiation in PPP road projects were adopted. Quantitative method is needed to measure the renegotiation influence factors in PPP road projects.

The mixing of both methods allowed for objective comparison of the outcome of both approaches as well as a thorough evaluation of the incidences of renegotiation in PPP road projects.

There is also the conduction of a full investigation based on the findings of the literature and the preliminary pilot survey. This thorough investigation constitutes the central data collection and encompasses both qualitative and quantitative studies. The conduct of the pilot study led to the refinement of the research instruments based on the comments and suggestions of the respondents about renegotiation and value for money. However, the interviews conducted at the advanced stage of the research were carried out to elicit information for collection of the data. The reason for this decision is to ensure that the data collected adequately address the empirically motivated research as indicated in objectives 3, 4 and 5 of the first chapter of this thesis. The administration of the questionnaires followed the interview surveys whose respondents willingly consented to participate in the study. The analysis of the findings leads to the development of a VfM renegotiation framework for renegotiation of PPP road projects. The reason for the consideration towards the elaboration of a VfM renegotiation framework in the succeeding chapters of this thesis was to foster the achievement of public sector VfM objectives.

5.5.2 Mixed Method Research Variables

Research variable is the attribute of a research and indicates the several facets, cases, and components of the research. Researchers usually identify variables of research because it is an entity, which varies and does not have a definite or specific quantity but takes on different values (Trochim, 2006a). A variable can be resolved into the empirical dimension and can be categorised into constituent's units namely: independent and dependent variables (Trochim, 2006b). The types of variables include in addition to independent and dependent variables extraneous and descriptive variables. The variables of research are:

- Independent Variable: This is a variable, which influences the outcome of the dependent variable. It is a manipulator and threat to the resultant position of the dependent variable. For instance, the independent variable of this research is the renegotiation of PPP road projects. This variable has a direct effect on the criteria of VfM, which are, cost, time, quality, risk, project finance cost, Whole Life Cycle cost, concessionaires profit and user's satisfaction amongst others.
- Dependent Variables: The dependent variable impacts the independent variable and imposes an influence on the independent variable. Research dependent variables are affected and influenced by the independent variables or other variables. Based on this description, value for money is the dependent variable of this research whose results, position or values have been found to be affected by the renegotiation of PFI (DBFO) road projects (Sarmento, 2014; Guasch et al., 2014).

- Descriptive Variables: These are variables requiring investigation or reporting and which have no conclusion concerning the responsible factor. However, the research must provide answers concerning the position or situation of these variables because of the impacts of some or all other variables (Carter et al., 2000). The independent variable directly impacts the explanatory variables in most instances. Hence, the descriptive variables of this research are user's satisfaction, quality, time, cost and concessionaires profit, which represent the criteria's of VfM.
- Extraneous Variables: These variables provide alternative causal explanation and relate or link the dependent with other variables, i.e., independent and the explanatory variables (De Vaus, and De Vaus, 2001).

Having identified the appropriate decision regarding the research variables of the mixed method of research, it is necessary to identify and establish for adoption in this research a suitable strategy for the study. Denzin and Lincoln (2005) state that an inquiry strategy could encompass the skills, assumptions, enactments and material practices appropriate for adoption in a research. Grounded theory, ethnography, phenomenology, case study and narrative research are amongst the most common strategies usually adopted for the execution of qualitative research (Saldana, 2015, Alvesson, and Skoldberg, 2009). The reason for the adoption of these techniques for qualitative research inquiry is because of the readily available systematic procedures and rigorous methods of data collection and analysis inherent in its adoption (Creswell, 2007). As previously described, this research used mix strategies to make enquiries into the aim and objectives of this study. These mixed methods include; (i) Literature review; (ii) case studies with the use of QSR NVivo analysis; (iii) Questionnaires analysed with SPSS software. The succeeding sections present the research framework, which discusses the rationale for selection of each of the methods used for the collection of the data and the analysis under each of the distinct purpose of the mixed methodology approach.

5.6 RESEARCH FRAMEWORK

A research framework has been developed to show the four critical stages of the research from inception to completion. The research framework and process including discussions based on each of the stages indicated in the framework are given in this section as shown in Figure 5.3.

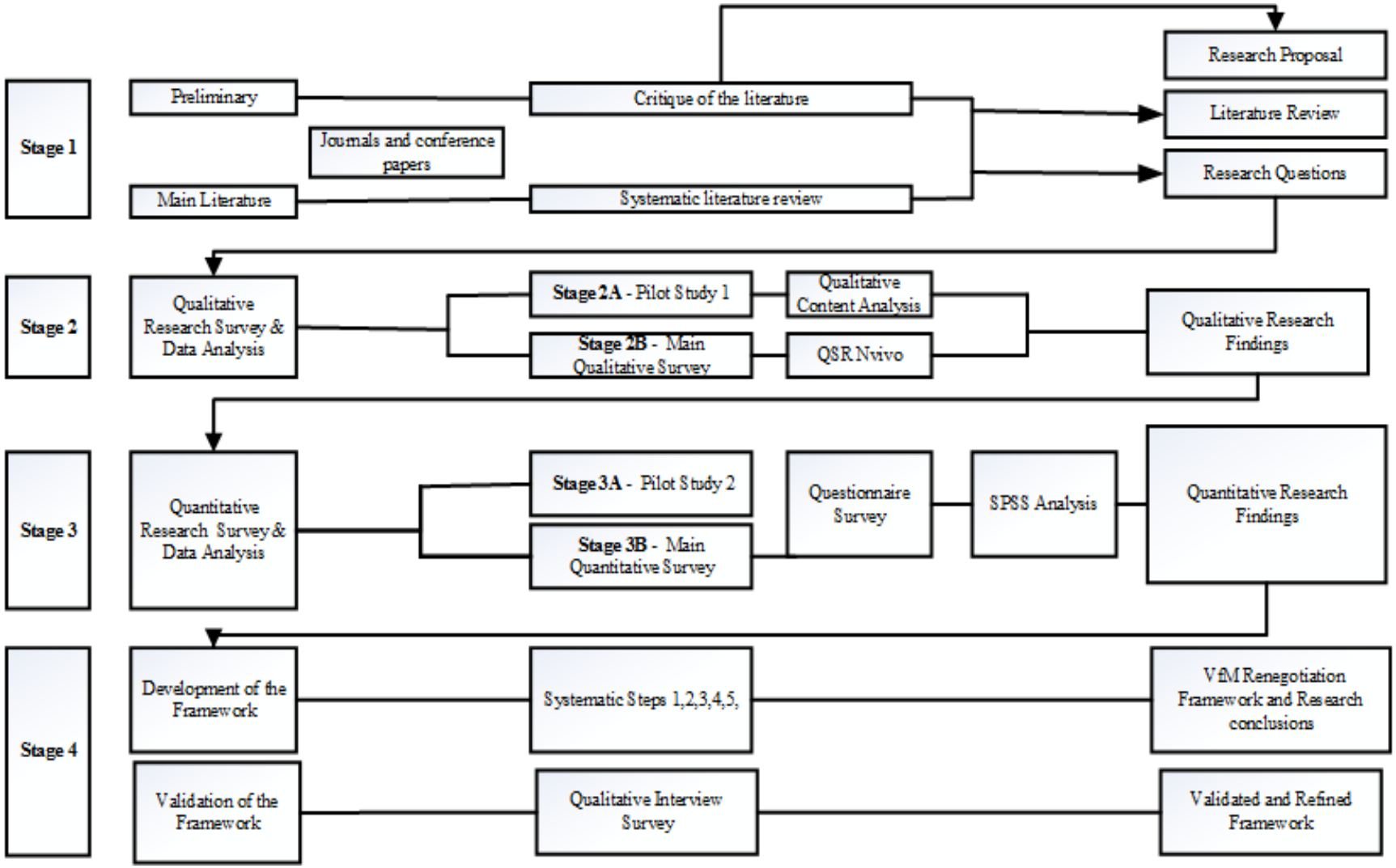


Figure 5.3: Research Framework and Process

5.6.1 Stage 1- Theoretical Stage of the Research Framework (Literature Review)

Stage 1 involves the preliminary and main literature review. Eighteen (18) subject areas form the basis for the identification of the research gap in PPP transport project literature. Subject domains that are found having a high knowledge gap in the body of knowledge of PPP transport projects grouped accordingly. The transport modes include rail, ports, airports, bridges/tunnels, urban transit and roads. However, road sector is the most discursive sector of all the transport modes, which have the highest literature citations. The literature findings were evaluated, and data reduction technique was employed through analytic categorisation of the subject areas, and individual keywords (Neuman, 2006; David and Sutton, 2004). Hence, the review adopts the content of the pieces of research, which serves to address the objectives identified in section 1.4 of the thesis. The reason for the extensive literature search and review was to ensure that the questions developed at the preliminary stage are well researched through desk study for appropriate test and pilot study.

Figure 5.3 further shows the secondary research study, which involves the review of the literature such as journal and conference papers, scholarly textbooks amongst others. An in-depth and focused literature review began at the commencement of the analysis of the data collected to strengthen the argument of this research further and improve the credibility of the research findings (Charmaz, 2006). The literature identifies various approaches usually adopted in the analysis of textual and written data, e.g., journal paper and conference proceedings. These strategies include; literature critique, systematic review, content analysis, semiotics, deconstruction, and hermeneutics (Grbich, 2012). A thorough critique and systematic review of the literature in the analysis of the preliminary and primary documentation used in the writing up of the research proposal as well as the chapters of the literature review.

All these sources of secondary information provided an avenue to identify and develop research gap concerning issues bordering on the use of PPP in the delivery of infrastructure projects, especially roads. These assisted towards the writing up of the research proposal and the literature review chapters. Though, the supervisory team advice provided the direction with regards to current issues in PPP studies as well as feasible, viable areas of PPP research. The timely information from the supervisory team provided the right direction and strengthened my resolve and decision to investigate PPP renegotiation in road projects regarding VfM achieved for the public sector. The secondary research conducted provided the background information required for this study including the exploration of available research methodologies to ascertain the most appropriate method for the pilot studies and initial investigation.

The preliminary research effort involving desk study, literature search, review of crucial PPP areas culminated in the writing of a research proposal. The primary literature review was linked to the preliminary desk study and constitutes the first and the most crucial phase of this research as it forms the pedestal upon which other stages of the research methodology rest. This submission agrees with Bryman (2008), which state that there is the avoidance of the trap of reinventing the wheel because of the establishment of the body of the knowledge within the research area through the review of the literature. Thus, literature review began at the very outset, i.e., conception stage of the research and establishes the focus and central areas of the study as shown in Figure 5.4.

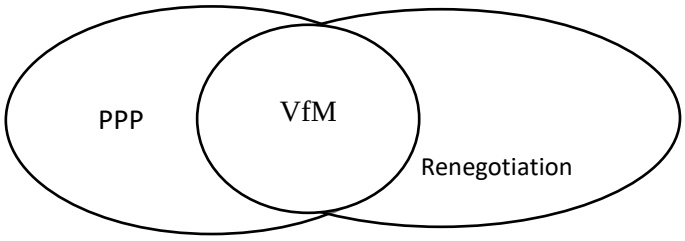


Figure 5.4: Main areas of the Literature Review

The preliminary review of the literature necessitated an in-depth literature review in the exploratory phase based on the data collected and the results obtained from the analysis. The research gap, research problem, aims, and objectives established in the initial literature review form the benchmark for the conduction of literature exploration, which concisely follows as shown in Figure 5.3. The exploratory research phase, therefore, indicates that the novel findings of the desk research were within the sphere of the respective vital variables and research criteria. The statement of the research goals, which constitute the first stage of the study, addresses objectives 1 and 2 of the research (Please see section 1.4). Thus, there are specific references to PPP road projects, their renegotiation incidences, and the respective renegotiation leading factors including VfM. The literature review further intensifies and conducted throughout the study to update previous literature findings of the main subject areas of the study. These serve to support the arguments emanating from the results of the data analysis towards improving the reliability and the credibility of the findings of the research.

5.6.2 Stage 2- Qualitative Research Survey and Data Analysis

Qualitative research survey and data analysis stage are one of the advanced stages of the research, which involves the collection and analysis of the qualitative data to address objectives (3), (4), and (5) as identified in subsection 1.4 of Chapter 1. As earlier indicated, the available strategies for making qualitative enquiries are assessed.

The results of these evaluations at both the pilot and advanced stages reveal that case study methodology with Qualitative Content Analysis (QCA) approach is appropriate for the research. Case study methodology was suitable because it affords the opportunity of a comprehensive and in-depth investigation into the renegotiation experiences of the respondents on the respective case study projects (Denscombe, 2007). Though, case studies represent a strategy of inquiry into a subject; they also stand to connote the choice of what the researcher intends to study (Creswell, 2007, Denzin and Lincoln, 2005). Since the renegotiation of PPP road projects was not clear at the time of the literature review regarding the UK experience, it became evident to adopt case studies for the execution of the research. Yin (2003) corroborate this submission by stating that the case study methodology is appropriate in a situation where there is no apparent justification for the separation of the phenomenon of study from its context or environment.

Case studies have been attested to assist in gaining a proper understanding of the dynamics of a setting and sphere. It is also useful in investigating complex situations to achieve positive outcomes of life events (Barret and Sutrisna, 2009). Therefore, research into PPP road projects renegotiation was found complex in the case of UK research environment because the subject is new and requires thorough preliminary field studies, which engages experts working in practice to give information that guides the feasibility and viability of researching in the subject area. Therefore, the first pilot study on two cases of PFI (DBFO) road projects assisted in gaining first-hand information regarding renegotiation as explained in the next sub-section.

5.6.2.1 *Stage 2A- Pilot Study 1*

A case study is a qualitative research strategy involving the analysis of one or multiple case study in detail. However, the first pilot study adopts interviews of professionals to ascertain the renegotiation incidences in the UK PFI (DBFO) road projects and their implication on VfM. This assist to improve the feasibility and viability of researching within the scope of the main areas of the study in UK PFI (DBFO) road projects based on the few pieces of evidence in the literature. The second stage of the research, therefore, adopts case study semi-structured interviews to pilot the investigation by the findings of the literature review. The first pilot research involves both public and private stakeholder's interviewees from two PFI (DBFO) road projects in the UK. The interviews conducted ascertains the renegotiation characteristics and peculiarities in the context of the UK PFI road projects. Moreover, the reason for the adoption of more than one case studies at the first pilot study stage is to allow for robust and elaborate findings on the renegotiation of PFI (DBFO) road projects to address the research objectives comprehensively.

The pilot study conceptualises the theoretical research and establishes the basis for the advanced research towards framework development. Moreover, the essence of the pilot study is to ascertain the integrity and reliability of the findings of the literature review regarding PPP road projects renegotiation and to compare the outcomes of PPP road projects renegotiation from other regions of the world. Hence, the findings of the literature were objectively compared with the case studies interviews findings at the initial stage of the research. Thus, the first pilot study complements the theoretical conclusions of the literature and form the basis for the development of the questionnaire.

5.6.2.2 *Stage 2B- Main Qualitative Survey*

Data collection regarding objectives 3, 4 and, 5 enumerated in Chapter 1 of this thesis takes place after the establishment of the theoretical basis of the research. The research design adopted at this stage is as indicated in Figure 5.5.

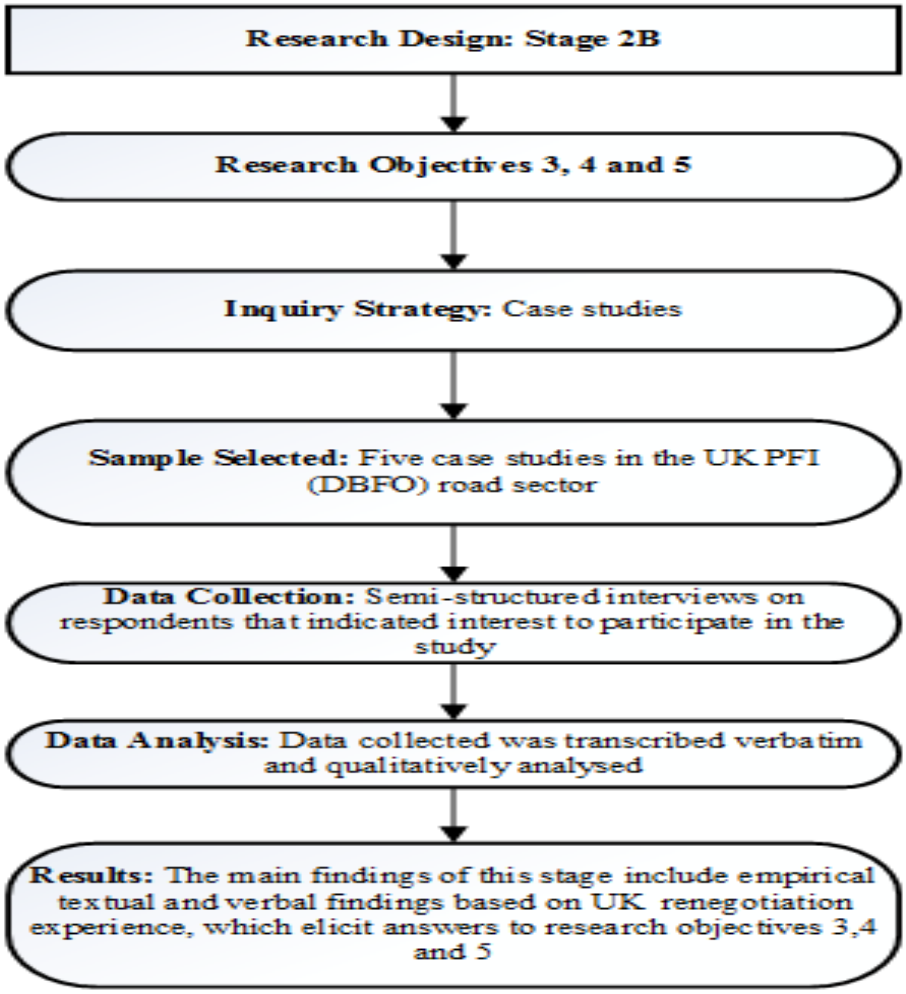


Figure 5.5: Research Design for Stage 2B of the Framework

As shown in Figure 5.5, this stage provided an explanation on the renegotiation experiences of PFI (DBFO) road projects in the UK based on the verbal data collected through the semi-structured interviews, which were transcribed into textual data for NVivo analysis.

The use of NVivo for the qualitative analysis of the data collected through the interviews followed the procedure of ground theory. The method is a general methodology involving interpreting through rigorous thinking and conceptualising data (Strauss and Corbin, 1994). The data collected were first audio recorded, transcribed and read for accurate interpretation based on sound thinking. These ensure systematic review, data collection and analysis. The systematic review of the literature and the collection and analysis of qualitative data agree with the evidence that abound in construction management literature regarding the development of theory and theoretical assumptions (Carter and Fortune, 2008). The theoretical constructs could be from the literature or theory gathered from other sources, e.g., public and government policy documents. Hence, the full description and explanation of the phenomenon under investigation are facilitated by Qualitative Content Analysis (QCA) and with the aid of NVivo software version 11. The data collected through interviews followed methodological procedures as shown in Figure 5.5.

The methodological procedures adopted to align with the principle of grounded theory, which involves the gathering and analysis of the data through the defined research process. The methodology ensures effective integration of the findings of the literature and the interviews conducted at the pilot stage towards the design of an instrument that facilitates the development of a framework (Thompson, 2010). The framework developed is considered fitting and appropriate for adoption since it addresses the current renegotiation challenge observed within PPP road projects as explained in Chapter 1 of this thesis. Thus, the approach to model development involved the combined use of the findings of the literature and case studies, which are integrated into the VfM renegotiation framework as explained in chapter 9.

More than one case study allows for robust and elaborate findings, which addresses the research objectives from a more comprehensive and holistic standpoint (Yin, 2009). As a result, the research seeks pertinent information through the pilot survey regarding the feasibility and viability of researching within the scope of the main areas of the study in UK PFI (DBFO) road projects. Respondents from both the private and public sectors indicated interest to participate in the study.

The targets respondents involved professionals and managers working on PFI (DBFO) road projects in the UK excluding experts working on PFI road projects in Northern Ireland. The reason for this consideration is because most PPP road projects in the UK are usually procured based on PFI (DBFO) road projects. The respondents possess the right experience on PFI (DBFO) road projects.

Representative case studies were selected within the UK at the exploratory stage. The consideration was to provide direction for the empirical work required at the advanced stage of the research. The literature supports the development of the necessary instruments to conduct the sophisticated research. There is the identification of cases of road concession projects within the sample population. The stakeholders were followed up at both stages of the data collection. Two respondents in each of the road projects indicated interest to be part of the pilot study stage.

The semi-structured interviews were conducted to elicit the opinions of the experts with considerable experience in public and private sectors on the objectives of the study. Experts are suitably chosen based on the satisfaction that they have enough hands-on experience in the industry and possess adequate knowledge of the subject area. The benefits of conducting qualitative data collection via the interviews are enormous as identified in numerous pieces of literatures, which highlights the advantages adduced for the conduction of a research survey via the interview technique (Denzin and Lincoln, 2011; Bryman, 2004; Punch, 2003). The qualitative interview research study conducted encourages the building of the relationship between the interviewee and the interviewer and helps in clarifications and cross-examinations of the experiences. The interviews at the first pilot stage also assist in the exploration of differences in the respondent's knowledge and aid in the proper presentation of the research outcomes amongst others.

The information collected in the respective case studies are form eleven interviewees were. Nine respondents gave full responses to the interview questions. The remaining two respondents are observers who assisted the main interviewees. Five of the respondents who provided complete answers are from the procuring authorities of the public sector while four respondents are from the private sector. Table 5.2 shows the background information and characteristics of the case studies. From these nine respondents, five are from the client and include respondents from the public sector, which are coded as follows: XY1-Pub; XY3-Pub; XY4-Pub; XY7-Pub; and XY8-Pub. Four respondents are from the private sector and include XY2-Pri, XY5-Pri, XY6-Pri and XY9-Pri.

The representatives of the client provided more responses in comparison to the private concessionaire involved in PFI DBFO road projects in England. XY1-Pub represent the government of Wales while XY3-Pub, XY4-Pub and XY7-Pub represent Highways England as public client representatives on CS2, CS3 and CS4 respectively. XY8-Pub represent the Transport Scotland on CS5. Table 5.2 shows the detail of all the respondents who identified with the public and private concessionaires on the PFI (DBFO) road projects. For easy understanding, the individual public-sector respondent is identified with code -Pub and the individual private-sector respondent is designated as -Pri in each instance as indicated in the 3rd column of Table 5.2.

Summarily, the public and private sectors in all the case study projects under investigation are the Highways England, the division of transport of the Wales government and Transport Scotland including the respective concessionaire companies on each of the case studies. The five projects investigated are in England, Scotland and Wales. The SPV is made up of the consortium of four companies. All the case studies projects are currently in operation and maintenance stages with their respective start dates and the number of years into the concession shown in Table 5.2.

Table 5.2: Background Information on Case Studies and Project Characteristics

S/N	Project. Code	Respondent Code	Sector	Project Location	Estimated Cost of PFI (£)	Project Stage	Contract Duration. (Yrs.)	Start Date	Year of PPP	Road Length (Km)
1	CS1	XY1-Pub	Public	Wales	132 Million	Operation	25	2004	13th	50
2	CS2	XY2-Pri	Private	England	6.2 Billion	Operation	30	2009	8th	188
3		XY3-Pub	Public	England	6.2 Billion	Operation	30	2009	8th	188
4	CS3	XY4-Pub	Public	England	520 Million	Operation	30	2003	14th	-
5		XY5-Pri	Private	England	250 Million New Build	Operation and Maintenance	33	2003	14th	50
6	CS4	XY6-Pri	Private	England	935 Million	Operation	30	1997	20th	120
7		XY7-Pub	Public	England	959 Million	Operation	30	1997	20th	120
8	CS5	XY8-Pub	Public	Scotland	-------	Operation and Maintenance	30	1997	20th	90
9		XY9-Pri	Private	Scotland	170 Million Constr. Cost	Operation and Maintenance	30	1997	20th	90

The section presents the mode of analysis of the interview data collected. The qualitative interview data collected at the pilot stage were audio recorded and transcribed. There are the interpretation and discussion of the transcribed data from the preliminary research based on the findings and served as a guide for the collection of qualitative data for the advanced stage. The recurring keywords were coded and collated in their respective thematic order of parent and child nodes as reflected in the transcribed interviews. The parent and child nodes, which stands as the recurring themes discussed during the meetings, are shown in Appendix 9.

This analysis as previously described involves PFI (DBFO) road projects in the UK and creation of an individual profile, nodes, codes and themes as enumerated in subsection 6.8 of this thesis. In total, there are nine interviews on five case studies in the UK. Three case study projects were from England, 1 case study project from Scotland and the last case study project was from Wales. The importation of the audio recording into the analysis software help in the creation of parent nodes on the NVivo template. Words, sentences and ideas with similar meanings and connotations were coded. After the identification of the parent nodes, the process ended. In addition to the parent nodes, the child nodes were created, which relates to the parent nodes.

Two NVivo parent nodes were identified from a comparative assessment of the responses provided by the respondents (See Appendix 9). These parent nodes include contract renegotiation and value for money, which represent two critical words of this research. Nine child nodes emerge from the two parent nodes and cover all aspects of the questions asked during the case study interviews. All these were carried out through axial coding as identified in the literature (Mehmetoglu and Altinay, 2006). The relationships and interactions that exist among the responses are in another set of categories under the parent nodes called child nodes. The child nodes were generated under the parent's nodes with the NVivo software as shown in Appendix 8.

On developing the child nodes through the process of selective coding, there is the integration of the parent and the child nodes with a central concept, which provides necessary details required for theory evolution (Bitsch, 2005). These child nodes assisted in an excellent manner in delivering a proper understanding of the parent nodes. The following outline presents the required phases of the qualitative research analysis with the use of NVivo. The first stage is the interview planning stage and involves the preparation of interview questions, the selection and gaining of the consent of the interviewees, the desk research and the modalities for carrying out the interview survey. The second stage is the qualitative interviews and its recording in a digital audio recorder including the safekeeping in a password-protected computer.

The third stage is the verbatim transcription of interview information recorded in the audio recorder. Appendix 10 shows a typical transcript of the interview administered on one of the respondents at the advanced stage of the research.

Furthermore, there is the analysis and creation of an individual profile, nodes, codes, and themes. These are through the QSR NVivo statistical software, which involves the creation of nodes, identification of similarities and differences in wording and coding including the identification and evaluation of the tree codes. For instance, the assessment involves the creation of *"nodes"* and central *"themes"* table, checking the need and adequacy of each node. Also, the clustering, grouping of nodes together, and writing a brief and explanatory note on the respective nodes and themes became necessary. The fifth and sixth stage involves the identification of general and unique *"themes"* from the interview transcribed and the presentation and descriptions of the research findings of the respective study objectives in a logical order to foster understanding. The questions were semi-structured in such a way that it enables the respondents to think widely and expand on their thought and knowledge of the subject.

5.6.3 Stage 3- Quantitative Research Survey and Data Analysis

The third stage of the study involves the collection of data with the use of a questionnaire. Two aspects of work were carried out at this stage, which is the pilot study 2 and the administration of the refined questionnaire data as explained in the two sub-sections discussed herein.

5.6.3.1 *Pilot Study 2*

There is the refinement of the questionnaire required for stage 4 of the research through a pilot study. The pilot study seeks to address the research objectives 3 to 5 and serve as a trial survey before the initial research at the advanced stage 4 of the research. The development of the draft questions required for the quantitative data collection address pertinent issues about objectives 3, 4, and 5. The draft questionnaire, which serves, as the instruments for data collection at stage 4 of the research were refined based on the comments and suggestions of the respondents.

The pilot investigation further affords the opportunity to test the methods and instruments of the research for suitability in the project environment. It further assists in the evaluation of the adequacy of the sampling frame of the study and the appropriateness of the structured questions. Also, the second pilot study proved beneficial as it enables the preliminary discovery and identification of the limitations, deficiency, mistakes, and errors, which requires necessary corrective actions before the commencement of the full-scale data collection at stage 4 of the research. The pilot questionnaires, therefore, help to guide the instrument through the second phase of the empirical data collection.

Hence, five questionnaire surveys from the field experts and senior researchers assisted in refining and modifying the questionnaire instrument for correctness, consistency, and accuracy towards the execution of the advanced research.

The comments and responses obtained were carefully modified and tailored to the advanced research. These also assisted in the modification of the questions incorporated into the full case studies instruments. The data collected at the second pilot study was premised on the findings of the literature and the interview survey, which was adopted in the development of the final questionnaire. It also established the course of the second phase of the quantitative research, assist in examining the accuracy and the practicality of the questionnaire designed to foster efficient conduction of the questionnaire survey. The enumerated activities uncover the significance of the research and further intensify and ascertain the need for the study, research problems, and sub-problems. There was the identification of the readiness of the proposed participants, the practicability of the research within the intended environment and the appropriateness of the research approaches and questions.

The questionnaire was developed based on the findings of the literature and the case study interviews. The results were subjected to further pilot study with industry experts working in procuring authorities and private concessionaire's establishments. The contributions of these industry experts included in the questionnaire, which reflects the renegotiation characteristics and peculiarities of the UK road concessions. The pilot study serves as an exercise to refine the findings of the literature and the case studies to ensure its applicability to the UK environment and foster respondents understanding. The reason is based on the researcher's knowledge that the questionnaire is to be completed individually by the respondent without any third-party interference or the researcher's assistance.

Five questionnaires were distributed to both the public and private sector representatives at the second pilot stage to elicit information on the case study projects. Three professionals working in the private and public sector and two academic members of staff at UK Universities experienced in PFI procurement assisted in assessing the questionnaire to ensure that the data collected are comprehensive and suitable for analysis. Also, two academic staff and industry experts working at universities in the UK provided answers to the questionnaire; personnel were contacted to ascertain the adequacy and conciseness of the questions, the respective identity of the respondents and to give their opinion on how to gain the audience of relevant stakeholders working on individual DBFO road projects in the UK. One of the purposes of the pilot study before the administration of the questionnaires is to ensure the relevance of the questions asked and the practicality of adopting the survey within the study population.

The results of the investigations, especially the questionnaire survey is discussed and form the basis for the execution of the sixth research objective, which is the development of a framework for VfM renegotiation in PFI (DBFO) road projects.

5.6.3.2 *Main Quantitative Survey*

The comments and suggestions of the respondents at the pilot stage are in the final draft of the questionnaire. On receiving the approval of the supervisory team, the closed-ended questionnaires requiring the respondents to choose from an array of answers received and analysed to provide solutions regarding objectives 3, 4, and 5 of the research. These led to the development, of a VfM renegotiation framework. Thus, the second stage of research at the fourth stage of the research framework involved the second pilot study and the administration of questionnaires. The process of the study for the advanced stage is in Figure 5.6.

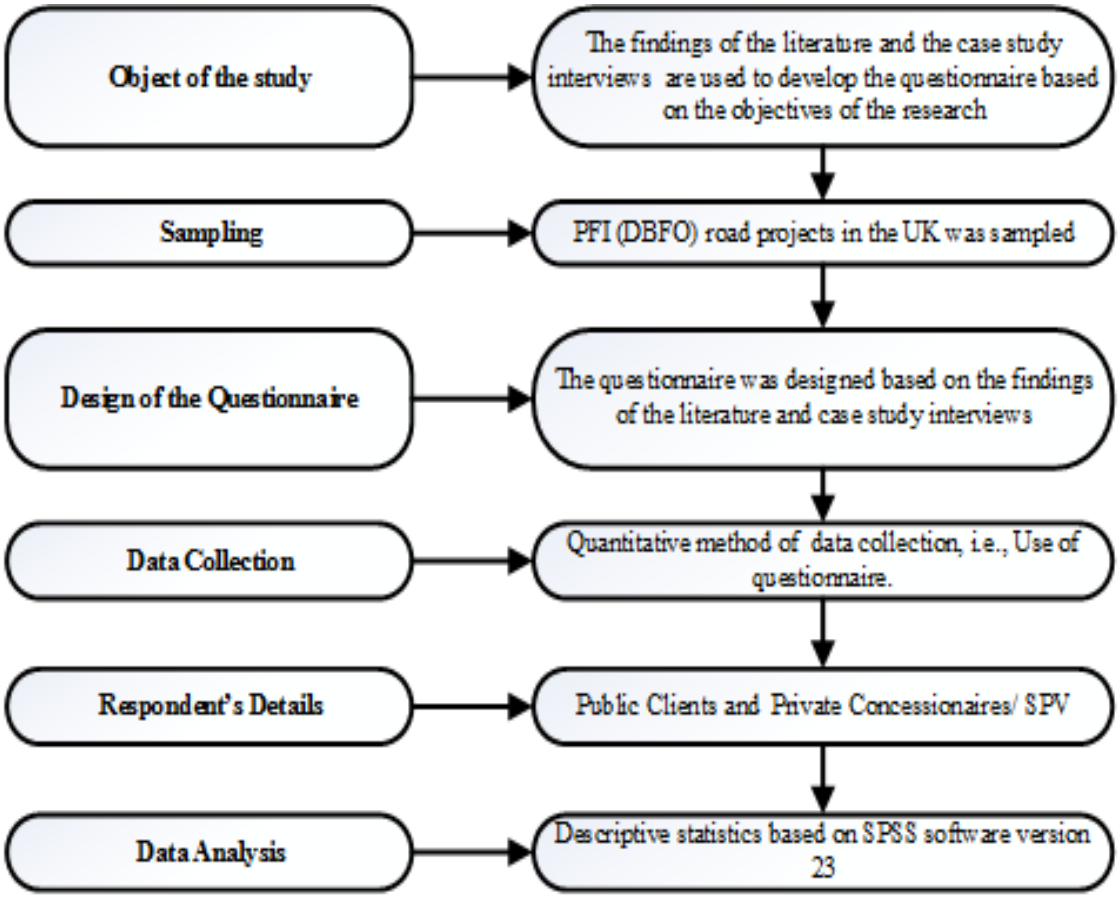


Figure 5.6: Questionnaire Survey Research Process

Out of the Forty-one (41) questionnaires administered, twenty-five (25) were completed, i.e. 60.98% response rate of the sampled population (England, Scotland and Wales road DBFO). However, a thorough analysis of the questionnaires reveals that only 22 surveys are fully completed by the respondents, which represents 32.35% of the available total of the public and

private sector respondents in the UK (i.e., 68 respondents) as shown in Table 2.4. Hence, the responses received can be considered adequate and representative of the entire population of the study, which includes Northern Ireland, even though it is not part of the study. Blaike (2009) agree with this submission by stating that a researcher may choose an entire population of an investigation, or sample or select a whole element(s) of a sampling unit, as the sampling frame. This study chose PFI (DBFO) road projects in England, Scotland and Wales due to the decline of the Northern Ireland department of transport to participate in the research.

The response rate, as revealed by the analysis of the questionnaire is 32.35% based on the 22 respondents that fully complete the surveys from the sample population, which suggest that the data collected seems adequate. The evidence of the literature supports the argument based on the response rate of 20-30%, which is the norm in questionnaire surveys in the construction industry (Akintoye and Fitzgerald, 2000). Similarly, Sacks (2010) claims that student questionnaire surveys or employee surveys do not receive more than between 30-40% response rate or more, on average. The results of the quantitative study are discussed and form the basis for the sixth objective of the research, which is the development of a framework for VfM renegotiation in PFI (DBFO) road projects. The response rate of the central questionnaire survey is in Table 5.3.

Table 5.3: Response Rate of the Main Questionnaire Survey

S/N	Questionnaire Administered	Total Number Returned		Total Completed (Fully)	
		Number	Rate (%)	Number	Rate (%)
1	41	25	60.98	22	53.66

The results from Table 5.3 reveal that 53.66% respondents returned the questionnaire fully completed. The fully completed surveys, therefore represent 32.35% of the total number of primary renegotiation stakeholders (i.e. public and private partners) of the sample population as shown in Table 2.4 as earlier described.

5.6.4 Reliability and Validity of the Data Collected

Reliability of research is measured and understood in terms variance of the numerical results, which can be ascertained by an indicator, which shows the characteristics of the process of measurement process and instrument adopted (Neuman, 2006). The reliability test, therefore, evaluates the degree of dependability or consistency of the measure of a variable in given research. The internal consistency of the data collected is usually assessed when conducting a reliability test to identify whether the degree that makes up the scale relate together (Pallant, 2010).

The data collected are typically measured to evidence the reliability of the results based on a set level and standard while providing information regarding the relationships between the individual items in the scale. One of the most commonly used indicators used to measure the internal consistency is Cronbach's alpha coefficient (Pallant, 2010). DeVellis (2003) as cited in Pallant, 2010), the Cronbach alpha coefficient of a scale should be above 0.7. Table 4.9 gives the Cronbach's alpha values of the scales used in this research. The reliability of both categories of respondents measured as shown in Table 5.4

Table 5.4: Overall Cronbach's Alpha Values of the Categories of Respondents

Renegotiation Involvement (Yes)			**Renegotiation Involvement (No)**		
Question No	**Variable**	**Cronbach's Alpha**	**Question No**	**Variable**	**Cronbach's Alpha**
Q9_1-37	Factors leading to renegotiation	0.919	Q9_1-37	Factors leading to renegotiation	0.000
Q10_1-14	Impacts of the renegotiation VfM criteria	0.952	Q10_1-14	Impacts of the renegotiation VfM criteria	0.411
Q27_1-42	Measures to ensure the achievement of VfM at renegotiation	0.956	Q27_1-42	Measures to ensure the achievement of VfM at renegotiation	0.781

As shown in Table 5.4, the only significant variable of respondents without practical renegotiation experience is 0.781, whose information is considered very reliable. Though, 0.000 could not conduct reliability tests due to few cases available for analysis. The results of the analysis suggest that the information provided by these respondents cannot be discarded entirely for two reasons. First, there is an indication that the responses given by the respondents without renegotiation experiences are based on privileged information by their respective positions in the public and private sector organisations. Secondly, the combined reliability and validity test results regarding the findings of the respondents involved with renegotiation and respondents without renegotiation indicate that most of the Cronbach alpha values are within the required range of significance.

The reliability and validity test statistics, therefore, ascertain the quality and consistencies of the responses provided by the respondents (McCrae et al., 2011, Forza, 2002). For instance, the reliability and validity test, based on the research objectives as defined in the data collected, highlights the factors leading to renegotiation, renegotiation impacts on VfM, outcomes of the renegotiation and measures to ensure VfM at renegotiation. Firstly, the internal consistencies and measurement of the data collected are calculated by testing the reliability of the sample through SPSS. Furthermore, the calculation of the Cronbach's alpha coefficient of all the items was completed in comparison with the overall total coefficient of alpha, to arrive at an estimation of the internal consistencies of the data collected, which assisted in establishing the results of the survey.

The values of the Cronbach alpha coefficient of all the items and overall total coefficient of alpha vary from 0 to 1 respectively. According to Field (2009), the number of issues on the scale determines the value obtained, i.e. the higher the number of items on the scale, the higher the alpha coefficient and vice versa. The significant value of the Cronbach alpha coefficient can be estimated as significant if the results or its value is between 0.7 and 0.9 (Field, 2009; DeVellis, 2003). Pallant (2010), citing DeVellis (2003), states that a Cronbach alpha value, which is above 0.7 proves to be significant and indicates the reliability of the system. In the context of the analysis of all the responses to the questionnaire used to collect the data for this study, the Cronbach's alpha values of the survey data are as shown in Table 5.5.

Table 5.5: Standardised Cronbach Alpha Values of the Questionnaire Survey Data

S/N	Question Number	Variables	Cronbach's Alpha (Standardised)	ANOVA
1	9	Factors leading to renegotiation	0.959	0.00
2	10	Impacts of the renegotiation on the VfM criteria	0.964	0.01
3	27	Measures to ensure VfM at the renegotiation of road DBFO's	0.941	0.00

As shown in Table 5.5, the results of all the 22 questionnaire numbers that are analysed with SPSS, falls within the remit of the Cronbach alpha values theoretically established. As a result, the findings of the questionnaire infer that the results obtained during the survey, regarding the respective variables of the research, are reliable and valid. Hence the responses of all the 22 respondents are adopted for analysis.

5.6.4.1 Mean Statistics Comparison and Analysis of Variance

All elements of the descriptive statistics were evaluated and through the estimation of frequency, such as the mean and Analysis of Variance (ANOVA) amongst others. The results of the questionnaire data provided information concerning the factors influencing the renegotiation of PFI (DBFO) road projects in their varying degrees, based upon the frequency and mean values amongst other things. Analysis of Variance (ANOVA) is used to explore data and verify the possibility of having more samples sharing the common trait of likelihood (Field, 2009). The central tendency and sample mean of the different items and data are compared and tested indirectly with ANOVA.

The results produced are usually the F-ratio, which compares the number of systematic variances in the data with the number of unsystematic variations. Therefore, the "F-ratio" test value can be considered as significant when the value obtained by evaluation is less than or approximately equal to 0.05 (5%).

In all the sections of the questionnaire analysed, the ANOVA values are less than 0.05, which justifies that more samples within the respective variables have typical traits of likelihood, and as a result there is evidence that the values of the data collected are significant, as shown in Table 5.5.

5.6.4.2 Relative Critical Index of the Research Variables

The critical index estimated and adopted for the interpretation of the level of criticalness of the respective factors, impacts and measures that have a mean value of 4-5 imply very critical factors. The mean value of a factor, which falls between 3-4 imply critical factors, while the mean value of a variable or criteria, which falls between 2-3, is considered moderately critical. Mean value of 0-2 is assumed non-critical and is regarded as a variable with less significance or level of importance. The criticality estimation of factors has been estimated through the adoption of the mean values. Though, standard deviation has also been found useful in other analysis of data.

Somers and Nelson (2001) indicate the criticality levels of individual variables through the means and standard deviation, based on twenty-two CSF's in descending order of importance, which are 5 = critical, 4 = very high, 3 = high, 2 = moderate and 1 = low: to establish the critical success factors across enterprise resource planning implementation stages. However, in the context of this research, the mean values are estimated in the case of each variable of factors, impacts, outcomes and measures, as identified in the questionnaires adopted in the data collection. The interpretation of the analysis on the criticality indexes was based upon the criticality level defined in the literature (Somers and Nelson, 2001).

5.6.5 Stage 4- Triangulation, Development and Validation of the Framework

The findings of the objectives 1,2,3,4, and 5 of the research, which are all premised on the literature review, qualitative case studies and questionnaire survey, informed the constituents of the value for money renegotiation framework. Figure 5.2 indicates how the research framework incorporates the respective objectives in each stage of the research process leading to the development of the framework. However, there is the mixing of the research methods to achieve the framework. Denzin and Lincoln (2005) describe triangulation as a term, which is used to give a vivid description of the adoption of multiple methods of research in a single study to foster thorough and in-depth understanding of the subject. Though, the literature shows that triangulation cannot be a tool for validation (Flick 1998). However, triangulation provides the depth of richness, rigour, comprehensiveness and complexity that research requires.

Based on the understanding of the importance of triangulation in a research, this study adopts the findings of the literature as established in chapters 2, 3, and 4 of this thesis to develop the research instruments for the case studies. The case studies findings as explained in Chapter 6 were mapped comparatively with the results of the literature as established in chapters 2, 3, and 4 towards the development of the questionnaire. However, the research instruments in both cases (i.e., interviews and questionnaire) were subjected to pilot studies, and the comments and suggestions were included in the survey instruments. Thus, the inquiry is composed of the triangulated results of all the stages shown in Figure 5.3, which are a literature review and case studies. The overall findings of the questionnaire are used in the development of the value for money framework for the renegotiation of PPP road projects. These results are presented in Chapter 8 of the thesis. There was, therefore, the need to validate the developed framework for renegotiation to ensure the achievement of VfM for the users.

Validation could be achieved through the involvement of internal and external stakeholders to the project and can be done through either qualitative or quantitative methodology as discussed in Section 5.4 of this thesis to confirm the accuracy and trustworthiness of the research framework (Bernard, 2013). The validation exercise, therefore, seeks to evaluate the developed framework from the potential user's perspective and helps to address VfM issues in the renegotiation of PFI (DBFO) road projects. The validity of the content of the framework was to identify potential users, and their respective background as indicated in Section A. Section B seeks to establish the relevance and ease of understanding of the context while Section C evaluates the applicability and usefulness of the framework to potential users during the renegotiation of road concessions. Though, the literature argues that validity can be a subjective logic given that the opinions of individuals could be different and contradictory (Kumar,2011). However, the validation of the framework was carried out on selected groups of experts that are within the class of potential users of the instrument to ensure that there is adequate knowledge of issues about renegotiation of PFI (DBFO) road projects.

The development of the framework is on the understanding and interpretation of the findings of the questionnaire, which consist of all the other segments of the research. The validation exercise assisted in illustrating the applicability, reliability and usefulness of the framework for the evaluation of renegotiation regarding the achievement of VfM for users.

5.7 SUMMARY OF THE CHAPTER

This chapter explains the procedures and process adopted in developing the research design, instruments, and methodology. The information collected, and their method of analysis was discussed extensively in this chapter. There is the explanation of the rationale for the mixed modes of research adopted was explained. There is a thorough explanation regarding how the diverse techniques utilised in the study address the research objectives 3, 4, and, 5 in chapter 1 of this thesis. The characteristics of the respondents regarding their profile, number of responses and other details of the case study projects are in this chapter. The chapter further provides sufficient justification concerning the study population, the number of interviews conducted and the choice of respondents. The strategies adopted at every stage of the research including the techniques for the collection and analysis of data collected from the study population. Approaches that further enhanced the data gathered based on the research instrument are justified in this chapter.

The subsequent chapters'(i.e. Chapters 6 and 7) present the results of the case study interviews and the questionnaires. Also, there is the discussion of findings based on the methodology and analysis techniques described in this chapter in the subsequent sections of this thesis.

CHAPTER 6 DESIGN-BUILD-FINANCE-OPERATE ROAD PROJECTS CHARACTERISTICS AND RENEGOTIATIONS PERSPECTIVES

6.1 INTRODUCTION

This chapter reports the research undertaken within the UK PFI (DBFO) road projects, based on the qualitative methodology described in Chapter 5. A qualitative method through the interview technique for the execution of all five case studies based on objectives 3, 4 and 5 of the research as stated in chapter 1. Relevant and pertinent information of each of the case study project is discussed in this chapter towards identifying the following: factors leading to renegotiations, the impact of renegotiation on VfM criteria, the outcomes of renegotiation and VfM implications of the renegotiations amongst others. The case studies result through a cross analysis approach, and the empirical findings are comparatively evaluated with the literature findings to conclude the study objectives in the context of UK PFI (DBFO) road projects renegotiation experiences. The findings enhance the understanding of the results of the literature and serve as instruments to pilot the data towards the second, advanced stage of data collection. The data collection findings of the second stage assisted in positioning the research towards achieving the aim and objectives outlined in chapter 1 of this thesis, especially the development of the VfM renegotiation framework.

6.2 CASE STUDIES RESPONDENTS PROFILE

Nine interviewees were interviewed on five case studies, as shown in Table 6.1. There are three categories of questions that require answers during the case studies interviews. The first category elicits responses from the respondents regarding information about the position, the sector, academic and professional background, characteristics of the project regarding length, location amongst others as shown in Appendix 2. In the second category, eight sub-questions were asked to address objectives 3, 4 and 5 of the research. These questions as shown in Appendix 2 attempt to evaluate and assess the renegotiations instances to ascertain the implications of achieving VfM

in PFI (DBFO) road projects. In the third category, thirteen questions seek to identify the guidelines and measures to address problems of VfM achievement (if any) during the renegotiation of PFI (DBFO) road projects (Please see Appendix 2).

Besides, the questions asked were designed to identify instances of renegotiation, the factors leading the stakeholders to initiate renegotiation request, the criteria adopted to assess VfM and impact of the renegotiation on the VfM criteria identified including the outcomes of the renegotiation. The respondents were also asked to comment on the VfM achieved for the stakeholders especially the public client and were also asked to identify measures taken to ensure achievement of VfM where the respondents indicate that there is evidence of VfM achievement for the client. Though these respondents are reluctant and unwilling to reveal cost and profit information after renegotiation, they were encouraged to make some practical examples to evidence the achievement of VfM for the public client. The semi-structured interview technique, however, allows the interviewees to answer the questions openly and based on the realities of the individual cases.

The findings of the preliminary interviews conducted on two case studies informed the design of the interview questions asked during the advanced stage of the study. An abstract of one of the transcripts of the interviews based on the three categories of questions asked is in Appendix 10. The analysis of the data collected from the five case studies leads to the development of critical themes and sub-themes of contract renegotiation and VfM in PFI (DBFO) road projects as identified and explained in subsection 5.6.2.3 of this thesis. Altogether, the profile of the case study respondents regarding their respective positions, sector, qualification and professional standing are in Table 6.1.

Table 6.1: Respondent Profile

S/N	Case Study Project	Respondent Code	Sector	Years of Experience in PFI Road Projects	Respondent Professional Standing	Qualification
1	CS1	XY1-Pub	Public	12	Chartered Engineer	-
2	CS2	XY2-Pri	Private	7	-	B.Sc. MBA
3		XY3-Pub	Public	9	-	B.A (Hons.) Business Mgt.
4	CS3	XY4-Pub	Public	15	-	-
5		XY5-Pri	Private	15	Chartered Engineer	-
6	CS4	XY6-Pri	Private	20	Chartered Engineer	B.Sc. (Hons) Civil Engr.
7		XY7-Pub	Public	4	Not provided	Not provided
8	CS5	XY8-Pub	Public	21	Operations Engineer	M.Sc. Civil Engineering
9		XY9-Pri	Private	20	Chartered Engineer	B.Sc.(Hons) Civil Engr.

The information given by the interviewees as shown in Table 6.1 reveals that four interviewees are from the private sector, with five respondents from the public sector. Also, five of the respondents have at least a bachelor's degree and a chartered status of relevant professional institutes respectively.

The respondent's years of experience in PFI (DBFO) road projects in the UK as indicated in Table 6.1 suggests that the respondents have significant experience of road concessions, particularly within the case study projects investigated. The number of years of PFI (DBFO) road projects as shown in Table 6.1 further reveal that the years of experience of the respondents is averagely 12 years' experience (i.e. six of the respondents have 12 years' experience and above). Only three respondents have less than ten years' experience of road concession experience in the UK, which is distinct from the general knowledge of PPP projects in the transport sector.

Therefore, regarding the number of years of DBFO road projects experience, the results of the interviewees as shown in Table 6.1 suggests that the responses received can be regarded as reliable and valid. The reason for this submission is due to the high levels of experience, qualifications and professional standing gained by more than 56% of the respondents. Moreover, information given by the respondents regarding renegotiations and change requests is observed to be accurate and consistent within the data. The renegotiation experience, which is on the personal involvement of all the respondents on the road concessions, gives credence to the reliability and unbiasedness of the data.

6.3 OVERVIEW OF CASE STUDIES

The five case studies in this section concerning their respective characteristics, project locations, project length, type and model of PPP including the respective procuring authorities and private concessionaires amongst others. The overview of the individual projects is as follows:

6.3.1 Case Study 1 (CS1)

The road is one of the leading ones in the UK, which extends through to Bangor from Chester. The road project has a lateral extension to the A5, which spans through Holyhead Docks via Anglesey in North Wales of the UK (Daily Post, 2015). The road network starts from the M53 motorway, also known as the Chester Southerly Bypass, and cuts the River Dee and the Welsh border into Bangor (Motorway Archive Trust, 2009). There is a dual carriageway with three-lanes, which allows free flow of vehicles through the A494 and the A55 up to Chester. This road is the main route to Holyhead, which has a significant port that links Britain to Ireland and includes other aspects of the strategic E22 Euro route, which extends from the Baltic coast to Dublin (Laing, 2001). The road affords all traffic to access England via a single lane curve at a

270-degree inclination through the hill to the A55 and A494, which has a speed limit distinct from the 70-mph norm (Motorway Archive Trust, 2009).

The ongoing works on the road include improvements and additional jobs partly funded by European money, under the Trans-European Networks programme, as the route is part of the Euro route E22. National Transport Plan (2012) state that the improvements to the road involved the removal of two roundabouts; also, there are options for transport improvements through to the A55/A4. National Transport Plan (2012) further appraises and evaluates the available opportunities to improve transport in North-East Wales and the A55/A494 areas. The works programme, for completion on this road, includes some possible changes as part of the planned improvements to the road network. These changes, which form improvements works to this DBFO road project, add the application of the management of the motorway, the provision of hard shoulders, the delivery of crawler lanes at strategic locations on the network and the redesign and improvement of slip roads. All of this highlights the upgrading and improvements type of work which is occurring on the road network.

The concession includes the design, building, finance and operation (DBFO) of a 40km trunk road of which 22-miles is a dual carriageway, which is worth £101 million in construction costs, making the total investment in the trunk road to be about £120 million (Senedd Research, National Assembly for Wales, 2001). The finance of the project is made possible through £132 million commercial loans provided in 1998 by a consortium of international banks, which is expected to be recouped by the concessionaire through shadow tolls based on the availability of the road to users and calculated on the number of vehicles using the road network (Jakab, 2016).

The National Assembly for Wales is the contracting authority, and the UK Highways (A55) Ltd is a consortium that comprises of John Laing and Carillion Private Finance, who were involved in this Design-Build-Finance-Operate (DBFO) road project. A Director, who oversees the transport directorate, heads the Network Management Division and operates as a representative of the public stakeholder (See Figure 6.1). Since the project is a DBFO, UK Highways (A55) Ltd employs the services of John Laing, Carillion Private Finance and Hyder consulting, which is a joint venture, saddled with the responsibility for the design and construction services. Gwynedd Civil Engineering acts solely as the provider of routine maintenance services (Daily Post, 2015). Also, there is a consortium of ten commercial banks led by Dai-Ichi Kangyo Bank Ltd., Dresdner Kleinwort Benson and EIB acting as lenders of the funds required for the implementation of the concession contract. Road users are expected to commence the use of the road from the M53 motorway, which is the Chester Southerly Bypass through the river Dee and the Welsh border straight to Bangor.

The procurement objectives of the road, according to Senedd Research, National Assembly for Wales (2001), is to ensure that there is a reduction of journey times for road users, including a reduction in the costs of operating the road for the concessionaire and road users towards attaining economic value. Moreover, the need to enhance safety for road users coupled with the provision of appropriate relief for traffic-related problems in and around the communities close to the road are a few of the paramount objectives of the contracting partner. The organisations involved in the CS1 contract are in Figure 6.1.

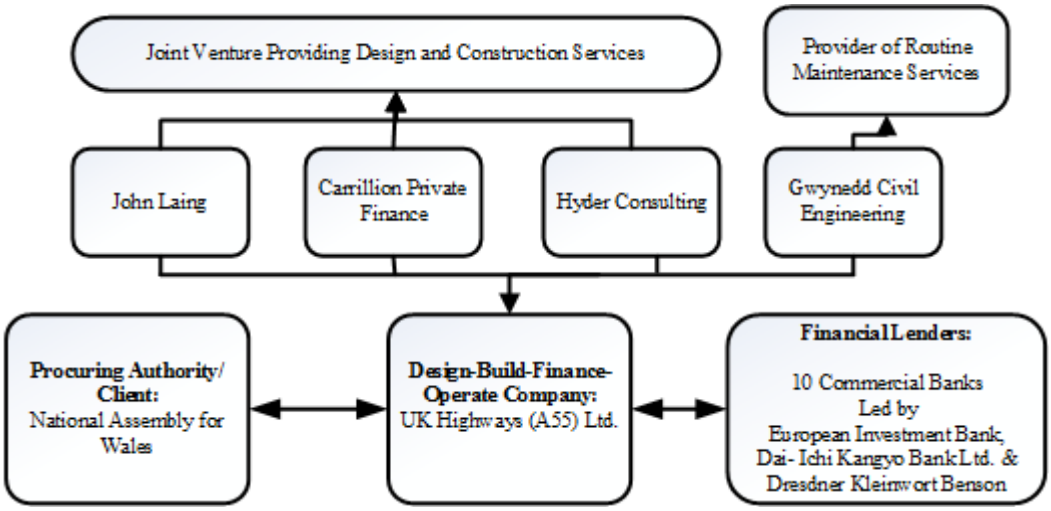


Figure 6.1: Organisations Involved in the CS1 Contract

This road project began in May 2009 with an expected end date of September 2039 (National Audit Office, 2010). Hence, the concession is for a 30-year period. The services commenced immediately after the financial close in 2009. Also, Connect Plus is entirely responsible for the management of the project lifecycle; though, the operations and maintenance (O&M) aspects of the work are executed and delivered by the Connect Plus Services, which happens to be a joint venture between Balfour Beatty PLC with a share of 52.5%, Atkins with a share of 32.5% and Egis having a 15% share. There are numerous instances of renegotiations in this case study project as discussed below.

6.3.1.1 *CS1 Renegotiations*

The renegotiation of the project occurred during the operation and maintenance of the road assets due to changes and improvements to the road project in 2009. The changes and improvements to the road network include the removal of assets like CCTV and replacing them with ones of a different standard. The reason for these changes is because many of the options outlined did not work out financially during the project implementation stage. XY1-Pub justifies the reason for these changes, which necessitated the renegotiation of the contract as follows: *"because the way the contract was written. It was a 1998 specification, which has a definition in the contract. CCTV*

since 1998 has changed a lot since then". These suggest that the old and unclear specifications necessitated a change in technology during the project implementation stage; this coincides with the literature that change in specification of assets can lead to the renegotiation of PPP road projects (Guasch et al., 2014; Bitran et al., 2013).

Renegotiation requests in this contract originated from the client through the appointed designated representative. The client had to initiate renegotiations through the provisions of the agreement since the original design could not address the current needs and circumstances. The experience in the UK differs from the experience of renegotiations in the Latin America, Portugal and Spain where the private partner is the prime initiator of the renegotiation of PPP infrastructure projects, especially in the road sector (Guasch et al., 2014; Cruz and Marques, 2013b; Acerete et al., 2010). The finding, therefore, suggests that either the client or the SPV can make renegotiation requests for DBFO road concessions. However, in this case, the procuring authority makes renegotiation requests, with the requests solely initiated to address the shortcomings inherent in the contract specifications. In contrast, the literature findings reveal that the renegotiation requests are at the insistence of the private sector company and, are in most cases, influenced by the corrupt renegotiation environment, which includes opportunistic bids and inappropriate designs (Engel et al., 2014a).

Interviewee XY1-Pub indicated that the cost of the contract regarding construction, operation and maintenance amongst other things remained the same even after renegotiation: *"because it was just a small part of the contract, it did not affect the terms. Marginally, and I mean marginally, by like 100,000 pounds a year out of you know like a multimillion project payment".* There is the implication that the changes in the cost of the contract were insignificant and did not have any significant impact on the VfM regarding the concession projects.

6.3.2 Case Study 2 (CS2)

The main work on this network began in 1975 and completed in 1986. The road project has been in existence since 1986 and spanned along the London Orbital, which links all Greater London (Skanska, 2009). It has an estimated length of 117 miles (188km) with essential junctions, including the orbital around Greater London, which makes it the second largest orbital road in Europe after Berliner Ring Road, and makes it one of the busiest road networks in Europe (Jakab, 2016; O'Flaherty, 1997). Overall, CS2 connects most significant land-maps in London and represents one of the UK's largest ever PPP and one of the world's most colossal orbital motorways. However, information on the entire road network reveals that the road network is a short non-motorway stretch, which can be found adjoining the Dartford crossing (A282) (CIHT, 2008; Queiroz et al., 2008). This short non-motorway stretch technically means the CS2 is not an orbital motorway.

Furthermore, the work involved in the partnership entails O&M of the entire 188km of the M25, existing road and new ones, including a further 188km into London and to two of the busiest airports in the world, Heathrow and Gatwick (Skanska, 2009). Also, there are up to 1,800 structures, including 750 bridges, 150 gantries, five tunnels and one long span bridge, which happens to be the Queen Elizabeth II Bridge. On successful completion of the road scheme, the following benefits are on the network: improved and more reliable journey times, reduced congestion, enhanced motorway safety, better driver information and faster-flowing traffic.

The traffic levels are more than the maximum capacity designed and envisaged when the motorway was open to traffic in 1986. There is, therefore, the need to widen and extend the whole of the M25 to four lanes due to the growth in the level of traffic. The continuous rise in traffic levels had resulted over the years in poor and unreliable journey times up to the year 1993 when the number of vehicles per day on the road network increased to 200,000 vehicles, which represent approximately 15% of the UK motorway traffic volume (Skanska, 2016). It was, therefore, necessary for the client at that time to add six lanes to the road section along Junctions 12 to Junction 15. The reliability of journey times became the objective of the procuring authority during the period, and there is evidence of the introduction of additional lanes to the road network to allow for higher traffic volume.

Skanska UK executed the construction aspects of the project, which included four components, which involved the widening of the motorway to four lanes. The refurbishment of the two-lane tunnel, each 1.25km, follows this work towards the development of a smart highway which involves the widening and conversion of an additional 45km of tasks and the removal of the toll plaza and cash collection point which is at the crossing of Dartford. The project operates as a Private Finance Initiative (Design-Build-Finance-Operate) road network in England. Thus, it is a 30-year concession, which is worth about £6.2 billion. Highways England (then known as Highways Agency) awarded the road concession project to the consortium of Connect Plus (M25) Ltd, consisting of Skanska Infrastructure Development and Balfour Beatty having 40% interest respectively (Skanska, 2009). Atkins and Egis also have a 10% interest respectively in the partnership (See Figure 6.2). Skanska UK and Balfour Beatty executed the design and build aspects of the work as a joint venture on a 50/50 consolidated basis (Skanska, 2009). Skanska UK leads the consortium with DBFO responsibility, including the maintenance of the M25 motorway for 30 years on behalf of Highways England.

As a result, the organisations involved in the DBFO contract includes amongst others, the procuring authority, i.e. Highways England, the SPV and Connect Plus (M25) Ltd, which is responsible for the execution of the DBFO road. Highways England employed PricewaterhouseCoopers, while Connect Plus (M25) Ltd secured the services of HSBC as their

respective financial advisers. Highways England contributed £500 million of the estimated contract sum of £6.2 billion towards the financing of the project (Villalba-Romero and Liyanage, 2016). Numerous financial lenders complemented the contribution of both the client and the concessionaire; these included the European Investment Bank (EIB) and 16 other commercial banks, i.e. Lloyds, Barclays, BBVA, SMBC, KfW, WestLB, HSBC, Bayerische, Dexia, RBS, Calyon, Helaba, Mitsubishi, NAB, Natixis and Societe Generale (Reuters, 2013). These organisations are in Figure 6.2.

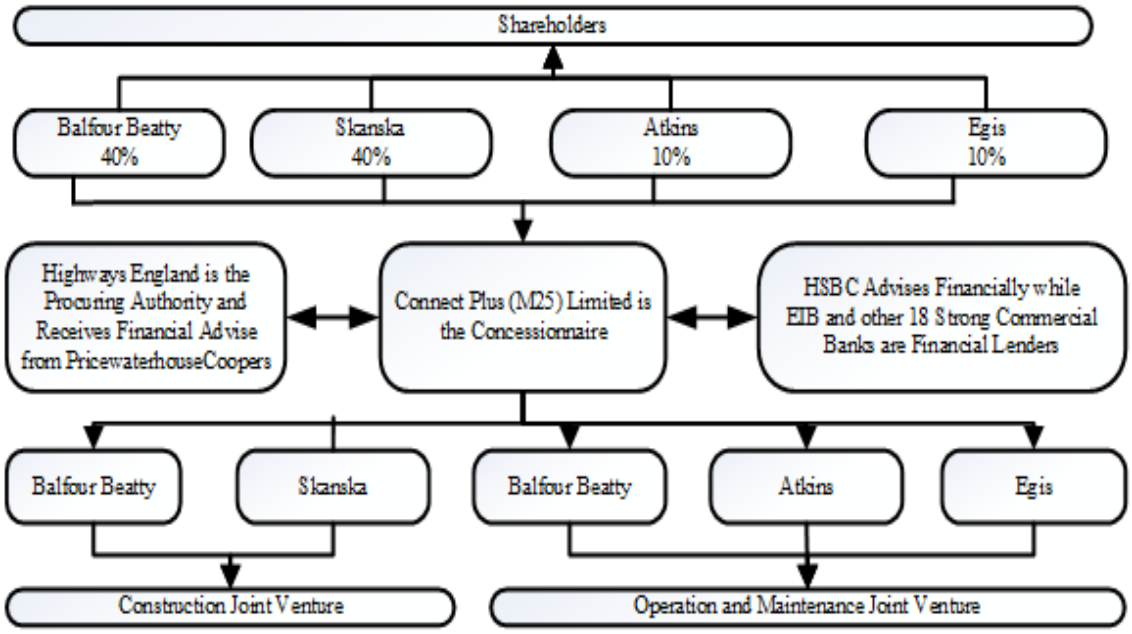


Figure 6.2: Organisations Involved in the CS2 Contract

This road project began in May 2009 with an expected end date of September 2039 (National Audit Office, 2010). Hence, the concession is for a 30-year period. The services commenced immediately after the financial close in 2009. Also, Connect Plus is entirely responsible for the management of the project lifecycle; though, the operations and maintenance (O&M) aspects of the work are executed and delivered by the Connect Plus Services. There are numerous instances of renegotiations in this case study project as discussed below.

6.3.2.1 *CS2 Renegotiations*

The primary works of the case study project are the widening and extension of the whole of the road network to four lanes, because of an increase of traffic on the road and the need to add six lanes to the section from Junctions 12 to 15 of the M25 orbital. There have been some changes, which led to many renegotiations in the project. These changes and renegotiations have had a significant impact on the contract, which started in 2009. However, most of the renegotiations experienced in most of the case studies occurred during the project implementation stages. The renegotiations ended in 2012, and the works aspects finished in November 2014. Both

interviewees XY2-Pri and XY3-Pub agree that the changes led to the amendment of the terms of the original contract to generate equal benefits to the primary stakeholders. Currently, two changes are under renegotiation, with more renegotiations envisaged or expected in the future.

The changes that have required amendments to the original contract consist of the latter upgraded sections, representing two areas of the small motorways; the first change to the contract happened in 2012 and amounted to £360 million. Since the early renegotiation of this contract occurred about three years after the inception of the deal, it coincides with the previous literature that PPP contracts are found to be renegotiated a few years after the agreement is signed (Engel et al., 2014). The research also reinforces the notion that most renegotiations are not in the public's interest (Engel et al., 2014). Hence, renegotiations have been the subject of attention across various policy discussions and documents across the world, which, coincidentally, justifies research into PPP road projects renegotiations.

The contract defines the changes to CS2, which entails the widening of the road network and adding additional lanes to the road. These corroborate the supporting literature that amendments to the contract can agree with a clause (Salacuse, 2000). The second change in standards involved the M3 motorway, consisting of additional works costing up to £5 million: these were not in the initial contract. The third change in standards led to another contract renegotiation, including the removal of toll collection obligations at the Dartford crossing. Stage 1 was carried out on behalf of the client, which happens to be a significant renegotiation costing up to £125 million in changes to the contract. However, £5 million was deducted from the concessionaire by the client to award it to a new company. This payment is assumed to cover the initial obligation vested in the concessionaire, which, in the opinion of the client, would be better executed by a new and independent company.

The fourth change in standards was the introduction of the new Regional Technology Maintenance Contract (RTMC) worth about £2.5 million. The fifth change on the contract is currently underway and entails the Dartford crossing (stage two), which involves the extensions and inclusion of new works during the operation, maintenance and renewal of the infrastructure projects. These works were not in all tasks envisaged in the original contract. The respondent's findings further reveal that there will be two new renegotiations, one takes place in 2017 and the second renegotiation will take place in the future. These changes include alterations to junction M25 and the junction 30-improvements scheme, which was completed in the early part of 2017. Secondly, there was a renegotiation to adhere to safety measures required in the tunnel on the road orbital; these measures were based on the EU directive to avert the loss of lives because of future incidences of fire outbreak.

Both respondents XY2-Pri and XY3-Pub agreed that Highways England, which is the public sector procuring authority in England, had initiated these renegotiations. In contrast, the literature findings show that a higher percentage of the renegotiation requests are by the concessionaire (Cruz and Marques, 2013a; Cruz and Marques, 2013b). The first change, according to XY2-Pri and XY3-Pub was the latter upgraded sections, which was initiated by the procuring authority due to the need to add the asset that was not part of the original contract. XY3-Pub corroborates this previous submission: *"therefore, there is a need to renegotiate the main contract because of the added assets."*

XY2-Pri also states that there was a contract renegotiation because of a change in scope of the work, along with changes to the maintenance costs in conformity with the provisions of the contract. In other words, as XY2-Pri outlines: *"It was an option in the contract, but it was never or not in detail, there is not to be a renegotiation of the contract"*. These imply that there were no detail renegotiation provisions regarding the criteria, procedures and guidelines for contract renegotiations. In most instances, renegotiation of contracts is usually discouraged as being impracticable. Small-scale changes were determined to take place under Schedule 26 of the DBFO contract: the schedule changes were not made available on request, as all the respondents considered the document to be confidential and private.

The change to the scope of the contract, which necessitated the addition of assets, according to XY2-Pri, consist of £360 million to the contract sum, which is an addition to the scope of works required under the contract. XY3-Pub corroborates this submission and states that there is an increase in contract costs when there is the addition of assets, and a reduction in contract costs occur where there is the removal of assets. The increased contract price is because of additional assets. However, there was no impact on the 30-year concession. These findings support the varying increases and decreases in costs; the results also indicate that the rise in price can be desirable if the stakeholders demonstrate VfM, as contract renegotiations are expected to foster the value of the project. An increase in costs demonstrates VfM if the client is satisfied with the service provided by the SPV regarding the quality and performance of the road network which takes into consideration safety and journey time reliability amongst other mechanisms.

Based on this, XY2-Pri states: *"the construction was early to complete, and on the budget and to date there have been some minor issues and some naggings about some defects rather than overall quality."* Regarding the concessionaire's profit, XY2-Pri agrees with XY3-Pub: *"any renegotiation intends to be effectively cost neutral. None of the parties will benefit or be a disadvantage by it. Therefore, you are effectively pricing the change. Seeing what the impacts are and making sure that it is not affecting either party from profit, budget or cost perspectives".* One can infer from this information that the contract undergoes renegotiation in such a way that

there was no adverse impact on the concessionaire's profit, user's satisfaction and other VfM criteria. This finding differs from the renegotiation experience identified in the literature as the concession cost, concession duration, concessionaires profit and user's satisfaction were adversely impacted (Engel et al., 2014; Sarmento, 2014).

XY3-Pub attested to the fact that VfM is consistent throughout the contract and does not vary with changes; VfM remains in a state of neutrality with renegotiation because the specifications and outlined programme at the inception of the agreement are fix. Also, due consideration was given to VfM by the stakeholders at the point of renegotiation as there was no loss and no gain situation for the project stakeholders, which implies that VfM remains constant throughout the project lifecycle as defined in the contract inception. Both XY2-Pri and XY3-Pub agree that there is evidence regarding the achievement of VfM for their organisations. XY2-Pri substantiates that the outcome of the renegotiation is as follows: *"Not because of the renegotiation. As I said before, the renegotiation is design as cost neutral. The renegotiation has not profited any of the parent companies or Connect Plus itself. It has not adversely impacted it".* The evidence is that no party to the contract unduly benefitted from the renegotiation process.

Moreover, XY3-Pub hint that there are benefits that can be attributable to the renegotiation of the projects, which were in detail in the Benefits Realisation Plan (BRP). However, there is a need to assess the document to ascertain the level of benefits from the project regarding VfM. XY2-Pri also indicates that there is a guaranteed rate of return on the finances, as well as a receipt of the value intended from the budget for both organisations. The comparison of the budget and value to the current expenses on the project imply that VfM was achieved for the consortium members of the SPV as well as the parent body of the consortium and the client.

Based on the financial model which represents a fixed budget required to maintain the network over the service year period. The success of the project regarding the achievement of VfM is measured based upon the financial model. XY2-Pri justifies this financial model principle: *"And to date, we are running pretty much on the budget at about 1% to 2% around that budget".* The findings, therefore, implies that there is evidence of VfM achievement during the renegotiations regarding the contract criteria and estimated cost. These reinforce XY1-Pub position, which identifies cost reduction as the main VfM objective of the client on the project. Hence, contract renegotiation in PPP road projects does not necessarily have to lead to overrunning costs, which is a high-performance measure regarding VfM achievement. The literature contrasts these empirical findings and posits that *"renegotiation of transport projects have in most instances resulted in the provision of government support in the form of subsidies to infrastructure development to address that nation's infrastructure gap."* Therefore, subsidies provided in the private sector can lead to higher charges regarding toll charges to the users or taxpayers.

XY3-Pub expressed a lack of knowledge regarding the position of other stakeholders concerning the achievement of VfM, while XY2-Pri differs in opinion and claims that the consortium and the parent body, as well as the client and the lenders on the project, achieved VfM. The reasoning for this, in XY2-Pri's opinion, is that both parties have signed up for the changes and renegotiations; therefore, the achievement of the objectives neither improve nor hinder the condition for both stakeholders regarding the renegotiation. Both public and private parties involved in the contract have not made a loss or made any undue or unnecessary profit because of the renegotiations in the road concession contract. Regarding road users, XY3-Pub states: *"I don't think our customers outside of the partnership or process of change understand the changes made, but all the customers (i.e. the stakeholders within the change process are all satisfied with changes made on the project and are all confident that there is the achievement of VfM."* This submission suggests that everyone within the purview of the partnership is happy with the outcome of the changes and consequently the renegotiation.

6.3.3 Case Study 3 (CS3)

This case study project consists of a motorway that forms part of the national road network between Scotland, the North East and the South of England, which provides a strategic connection between the roads in the UK (Hart, 1993). This network runs from Darrington to Dishforth and comprises of improvement works to the current operation and maintenance of 53km of the A1 road network, which spans between Darrington, south of the A1 /M62 interchange and the A1/A168 interchange at Dishforth (Highways Agency, 2011). The Highways England (then Highways Agency), the government, awarded the A1 route to the Road Management Services (RMS) in 2003 as part of its improvements programme for motorways across England. The upgrades involve three significant improvement programmes to the road network, which includes a full upgrade of the A1 road to motorway standards. Upgrading work to the A1Wetherby to Walshford, A1 Ferrybridge to Hook Moor and A1 Braham to Wetherby respectively (Highways Agency, 2011). The project is a 33-year concession, which started in February 2003 and it will reach completion in May 2036. The contract signed on the 13th of February 2003, and the project commenced on the 7th of May 2003, and the close or completion date is expected to be 6th of May 2036. The objective of the project is to widen the A1 road, by adding another lane, improving the road network and reducing congestion, thereby providing VfM for road users.

RMS (2014) states that the project was awarded to Road Management Services Ltd for the 33-year DBFO contract by the Highways Agency (now Highways England) for the operation and maintenance of the A1 (Highways Agency, 2011). However, the Road Management Services happens to be a consortium of numerous organisations. Indeed, the organisations involved in this case study project are in Figure 6.3.

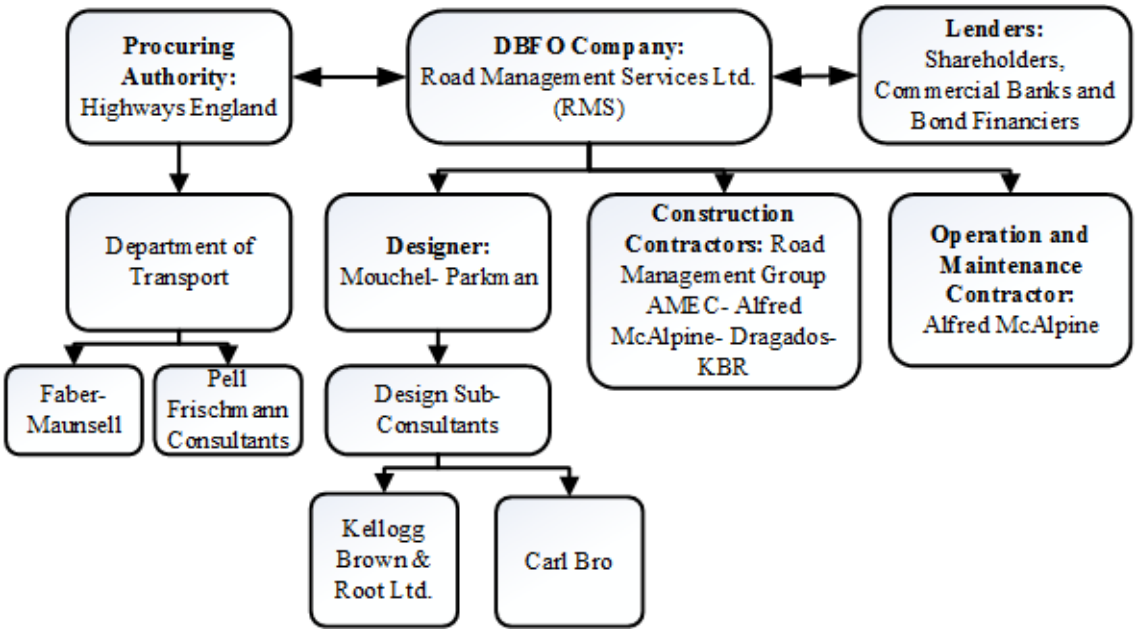


Figure 6.3: Organisations Involved in the CS3 Contract

As shown in Figure 6.3, the RMS, as a DBFO company, operates as a consortium, which includes Mouchel- Parkman, Road Management Group and Alfred McAlpine, representing the designer, construction contractor and operation and maintenance contractor respectively. Though the Highways Agency (now Highways England) awarded the 33-year DBFO contract to RMS for the operation and maintenance of the 53km stretch of the A1 (M) road network, the construction stage only lasted for three years. However, the literature indicates that after a re-tendering process in 2011, Lafarge Tarmac's contracting division won the 8-year contract. Hence, this company saddled with the responsibility of ensuring proper implementation of the two Targeted Programmes of Improvement (TPI) schemes, which creates 24km of a new dual 3-lane motorway (Association of European Transport, 2003). The A1 (M) Ferrybridge to Hook Moor is estimated to cost £183million and A1 the (M) Wetherby to Walshford is valued at £46 million for the technology improvements programmes (Briggs, 2003).

The work involved in this road project includes the design and construction of the improvements and maintenance of the highway, with a 30-year deadline. However, there are additions to the two TPI schemes between Bramham and Wetherby, which involves further upgrading works on the AI (DBFO) road projects, which brings the total up to £263 million for the A1 improvements (Association of European Transport, 2003). Thus, these improvements to the A1 (DBFO) add up to a total of £520 million.

The payment mechanism on this DBFO project road is through congestion management, although, the first eight DBFO road projects in England are procured on shadow tolls and are on the number and types of vehicles used on the road. The congestion management payment

mechanism was adopted to reduce the congestion rate on the road network, thereby providing an avenue to achieve the set VfM (Villalba-Romero and Liyanage, 2016). Congestion management is a recent development to ensure that payment is on how well the concessionaire manages the congestion and improvements are going to ensure the safety of road users on the road network.

The congestion payment is made based on the amount of traffic on the road, which is considered 90km/hr and above. However, this payment to the concessionaire commences after substantial completion of improvement works on the road network and at the inception of the operation of the road facility. Also, the safety of road users, regarding the safety record of the road network, is measured based upon Personal Injury Accidents (PIA) to users, which constitutes another basis for payment. These mechanisms are to ensure the achievement of VfM for the road users.

6.3.3.1 *CS3 Renegotiations*

According to respondent XY5, there is the signing of the DBFO on the 13th February 2003. The project commenced on the 7th May 2003 and had a contract completion date of 6th May 2036, i.e. the end of the contract period. The transfer of the project to the procuring authority will take place on or immediately after this date. Although, the contract period was extended from 30 years to 33 years to meet the contract requirements (Highways Agency, 2008); the government's intention for initiating the road project was to implement significant improvement and maintenance schemes of the project. These coincide with RMS (2014), which indicates that there are vast quantities of structures required on the road network; there are new road infrastructure facilities such as CCTV and emergency telephone units that were installed to increase the number of existing structures.

The data collected on this project reveals that there are changes to the standard of road assets and works that are in the contract documents. The standards adopted in this case are different from the ones agreed at the beginning of the project and exceed the monetary value of the requirements of the contract. The reason for these changes in the standards, according to XY5-Pri, is due to the provision of the agreement, which allows the contracting parties to introduce changes in the standards of materials, assets, and workforce, amongst other things during the project implementation. XY4-Pub corroborates that the changes in standards are envisaged in the contracts and are allowed during the implementation process of the road concession.

Even though XY5-Pri indicates the existence of renegotiations in the contract, which are minor, XY4-Pub proposes that there are only changes to the agreement, rather than the reality of changes leading to an amendment of the deal. There are contrasting opinions regarding the renegotiation process of this project. XY4-Pub states: *"It's to try and keep up with current standards and best practice. Some of the DBFO's that were signed before their standards were established in the*

90's. Otherwise, we pay quite a significant amount of money to change the standards. Some of the standards are integrated into the 1996 standards". XY5-Pri corroborates this submission by identifying changes to the contract: *"the project operates to all new standards. Unlike all other PFI's which have frozen standards, we adopt all new standards".* These new standards, according to XY5-Pri, primarily focus on roads and bridge work standards, including the supervised notes issued by the Highways England. However, in addition to the changes claimed by XY5-Pri, it is outlined that the contracting authority initiated the renegotiation experience on this project: *"It was due to the experience they have had on other PFI projects where the standards were frozen, and the projects have 30 years duration date".* These imply that the client allowed the renegotiations of the contract to take place due to prior experience of other DBFO roads where the standards were frozen.

The introduction of new standards, as indicated by XY5-Pri and XY4-Pub, attests to the uniqueness and distinctiveness of this concession contract in comparison to other PFI (DBFO) road projects. XY5-Pri notes that project standards are open to changes, and amendments are possible as included in the initial agreement. The reason for renegotiations of this project is on the need to keep up with new, modern standards and the best practices. The previous criteria defined in the agreement are deemed unrealistic and unsuitable to the present needs. Hence, there is a need to change and renegotiate the contract through the introduction of standards changes. XY5-Pri further attests to the existence of differences in standards in this project by identifying about 519 standards changes since the beginning of the concession contract in 2003. The introduction of these standards changes, according to XY5-Pri and XY4-Pub, reaffirm that these introductions were at the discretion and insistence of the client. The renegotiations according to XY5-Pri and XY4-Pub respectively, were based upon the client's previous experience, i.e. Highways England handling other DBFO where the standards were frozen.

6.3.4 Case Study 4 (CS4)

Case study 4 (CS4) is one of the PFI (DBFO) roads, which was procured in the 1990's as part of the government's Tranche 1A PFI's (Partnership UK, 2009). The length of the road is 118km, having two and three-lane carriageways for road users (Boles and Liyanage, 2013a). The road has significant conurbations and links to cities such as Newcastle, Sunderland and Middleborough. The Department of Transport is responsible for the management of the road on behalf of the government. Highways England serves as the body in charge of the regulation and handling of the contractual aspects of the project on behalf of the government.

The inception of PFI's as a procurement option in the UK in 1992 provided an avenue for the adoption of the DBFO model in the maintenance and upgrading of existing road infrastructures (Highways Agency, 2012). The SPV is Autolink Concessionaires (A19) Ltd, which is currently

owned by Sir Robert McAlpine Ltd. The contracting authority employed Autolink Concessionaires (A19) Ltd, i.e. Highways Agency (now Highways England) for the delivery of the DBFO contract. To date, Highways England and Autolink Concessionaires (A19) Ltd worked collaboratively in the management of the concession, as shown in Figure 6.4.

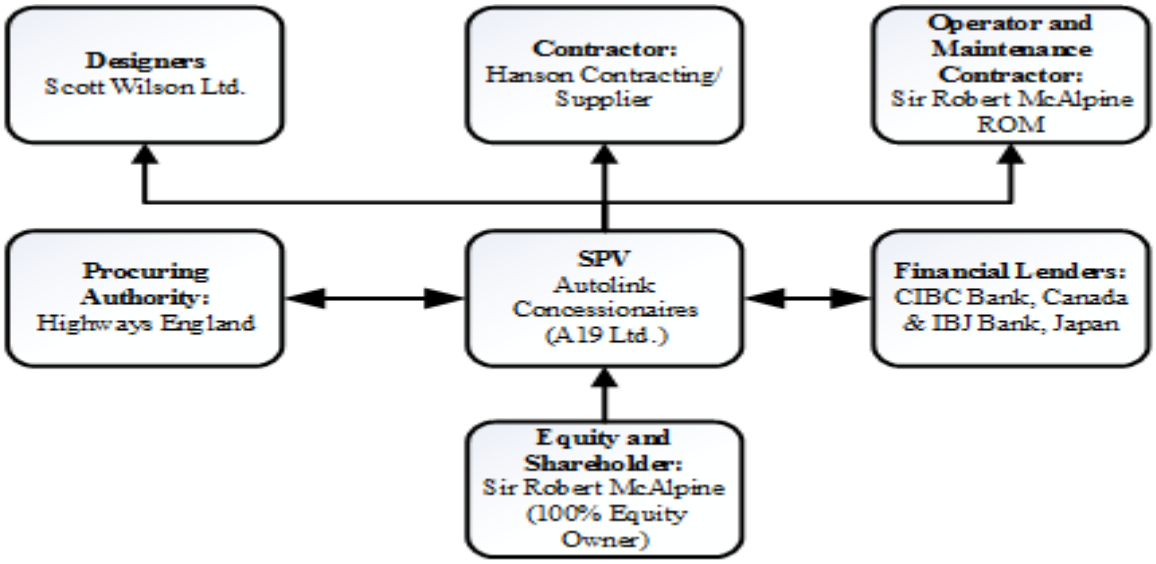


Figure 6.4: Organisations Involved in the CS4 Contract

Scot Wilson was the design consultant for the CS4, followed by the contractor, i.e. Hanson Contracting who was employed by Autolink Concessionaire (A19) Ltd for the design and building of part of the work. Sir Robert McAlpine established a firm called Sir Robert McAlpine Routine Operation and Maintenance (ROM) that executed the operation and maintenance responsibilities. The lenders of the funds for this project were CIBC Bank, Canada, IBJ bank and Japanese bank as indicated in Figure 6.4. These lenders are responsible for the fund's provision and act as lenders, as a last resort.

The road project is significant to local and regional boundaries. The A1 trunk road is one of the most used road networks in the area. Boles and Liyanage (2013b), opine that this road provides additional capacity to traffic, as it allows for service to some communities across the North East of England to further support the carriage capacity of the A1 motorway. The basis for receiving tenders is on performance objectives, and bidders' requirements, which were a shadow toll. It was a PFI initiative, which covers upgrading, works, operations and maintenance of the road network. The period required for the execution of all these works was 30 years. The break-even period needed to cover the costs and repay debt incurred was at 20 years from the contract start date. This amount of time was considered necessary to protect against the eventuality of lower returns, which could arise because of lower than expected traffic. Thus, this preserved the

investors' response in a situation where vehicles did not reach the expected level of the shadow toll arrangement.

Conclusively, changes to the regulatory framework, amongst other changes, have been identified as having a possible impact on the private sector. However, the government takes responsibility for this and in most instances, indemnifies the private sector against the implications of the changes. In addition to the regulatory changes, other characteristic changes and renegotiations occurred on the contract. These renegotiations especially, are explained in the next sub-section.

6.3.4.1 *CS4 Renegotiations*

The SPV on this PFI (DBFO) road project identifies that the stakeholders are 20 years into the 30 years concession, which have five core requirements to be completed. The first four requirements have reached completion, and the fifth one, which is the T viaduct structural refurbishment has been agreed to be extended until 2024 to ensure there is a profit in the technology improvements occasioned by the deterioration of the structure. The core requirements, according to XY6-Pri, include the need to build a new pathway, which stands at the sum of £48 million and involves the widening of the north and south areas of the T via the duct. Moreover, XY6-Pri opines that there is also a need to achieve the enlargement from Geo 2 lane to Geo 3 lane and to carry out refurbishment to a tilting bridge, which was a major crossing of the river Sunderland. The last requirements of this project are to fortify and assess completed road structures as part of the upgrading works achieved to date. There is also the need to install two emergency telephones north of the T side area of the road network.

The standards of this project are currently frozen since the contract was signed in 1996, which implies that the standards are unchanged as stated in the 1996 agreement. Since standards change due to the passage of time, the contract provides an allowance for the introduction of changes to the contract by additional works, something which XY6-Pri indicates regarding the two mechanisms in the agreement through which additional works can be introduced at renegotiation. These mechanisms according to XY6-Pri are as follows: *"The client which is the Secretary of State for Transport can introduce change and renegotiate those changes if he wants to. Also, there is a mechanism for us to promote change and the secretary of state will pay for that change. And there is a mechanism for us to introduce change where if we promote the change we will identify what needs to be improved"*. This statement by XY6-Pri agree with the literature, which identifies that renegotiation requests could be at the insistence of either the procuring authority or SPV (Bi and Wang, 2011). In some instances, both partners in a PPP arrangement have had a course to jointly initiate a renegotiation request (Cruz and Marques, 2013b).

So, most changes renegotiated in this contract were introduced by additional works through a notice from the clients in 2000, which is about three years from the contract start date. This finding agrees with the literature that contracts undergo renegotiation within a few years of signing the contract (Cruz and Marques, 2013a; Cruz and Marques, 2013a). However, the differing position is that the SPV as the party with a higher proportion of renegotiation requests.

The first additional works involved a small improvement scheme for the road network. These other works must be separately renegotiated with Highways England depending on the value of the works. If the capacity of the work is high and above £100,000, it must go through the process of competitive tendering. The changes in standards on this project add up to the governments' statistics of over 400 standards introduced nationally. In most cases, the reason for renegotiating contracts is the obsoleteness of specified standards occasioned by the long-term nature of the concession. Thus, XY6-Pri states: *"Yes, the standards are review and new technology introduced. When they (i.e., Highways England) examine the standards, they look at the new technology introduced and see whether they provide VfM and a safer road for the travelling public."*

XY6-Pri states regarding the value for money achieved for the public client as follows*: "We are now 20 years in and the condition of our network is excellent. Highways England recognises that there is the realisation of VfM. It is also known nationwide because people are commenting on the condition of the road. Some said that the condition of the road is the best and well maintained throughout the country"*. The SPV has achieved their profit objective on the contract and is satisfied with the outcome of the agreement to date. Similarly, the client representative agrees with the concessionaire about the benefit claim by the users. There is an assurance that the work undertaken is of the right quality and that there is the further possibility of achieving the whole life costs at the end of the contract period. There has been no variance between the VfM realised, and VfM defined for implementation at contract inception.

Conclusively, proper collaboration and a good working relationship within the concession arrangement resulted in the achievement of VfM during the renegotiation of this project. A productive partnership will also be beneficial to everyone. The stipulation of appropriate hand-back requirements and project plan reviews process in the contract also serves as a practice, which can sustain and improve the VfM defined in the agreement at inception. However, XY6 states that there is a need, in the PFI concession projects, for proper pre-tender administration and management, which seeks to appraise contractors' estimates with a view of reducing or eliminating aggressive and opportunistic bids. These, in the opinion of XY6-Pri, will serve as a measure to further ensure VfM at the renegotiation of PFI (DBFO) road projects. The need for effective and efficient management of the contract, particularly at the implementation stage of PPP road projects, cannot be over-emphasised to actualise VfM.

6.3.5 Case Study 5 (CS5)

The findings of the interviews reveal that the CS5 is a 90 km motorway. According to XY9, the CS5 is the A74 and M74 project road that spans from the English border going north 90 km up to junction 12, which is in Southern Yorkshire. However, there is a section of 37 Km along the CS5 motorway, which spans from Glasgow to Carlisle section of the M6 in the UK that is part of the CS5 (Merriman, 2009). The section of the CS5 from Glasgow to Carlisle incorporates 28.2 km from Paddy's Rickle Bridge to Cleuchbrae, and 8.8 km from the Scottish border to junction 44, which is north of Carlisle (Montgomery, 2015). The road project is one of the early design-build-finance-operate road projects awarded to Autolink Concessionaires (M6) PLC by Transport Scotland of the Scottish Office.

The Scottish government is the client that manages the contract through its representative at Transport Scotland. Autolink Concessionaires (M6) plc is the consortium of companies including Scott Wilson Scotland, which is responsible for the design and preparation of contract documents that serve as the basis for the contract administration. The contractor is Hanson, who works alongside Autolink in the construction of the project. Sir Robert McAlpine carries out the routine services, executing the operation and maintenance. Clearview Intelligence Ltd serves as the traffic measurement contractor that quantifies and measures the number of vehicles using the road for shadow toll payment.

The EIB led other commercial banks to provide the loan for 25 years towards the execution of the DBFO road project, which require the inclusion of the upgrading and enlargement of the road to full dual 3-lane motorway standard, which spans the entire between Glasgow and Carlisle (EIB, 1997). Though, EIB (1997) identifies the length of the road project to be 100Km. However, the findings of the interviews from both public and private sector partners reveal that the length of the road project is 90 km from the English borders going north 90km up to junction 12, which is in Southern Yorkshire. Therefore, there is a different position regarding the submission of this literature and the findings of the interviews conducted with both respondents on CS5. This study, however, adopts the 90 km road length indicated by both respondents on CS5. The DBFO road is to be operated by the SPV and maintained for 30 years. Thus, Autolink is entitled to receive shadow payment from the UK government for the actual number of cars using the road. This award was made on behalf of the Scottish Ministers on a concession basis as shown in Figure 6.5.

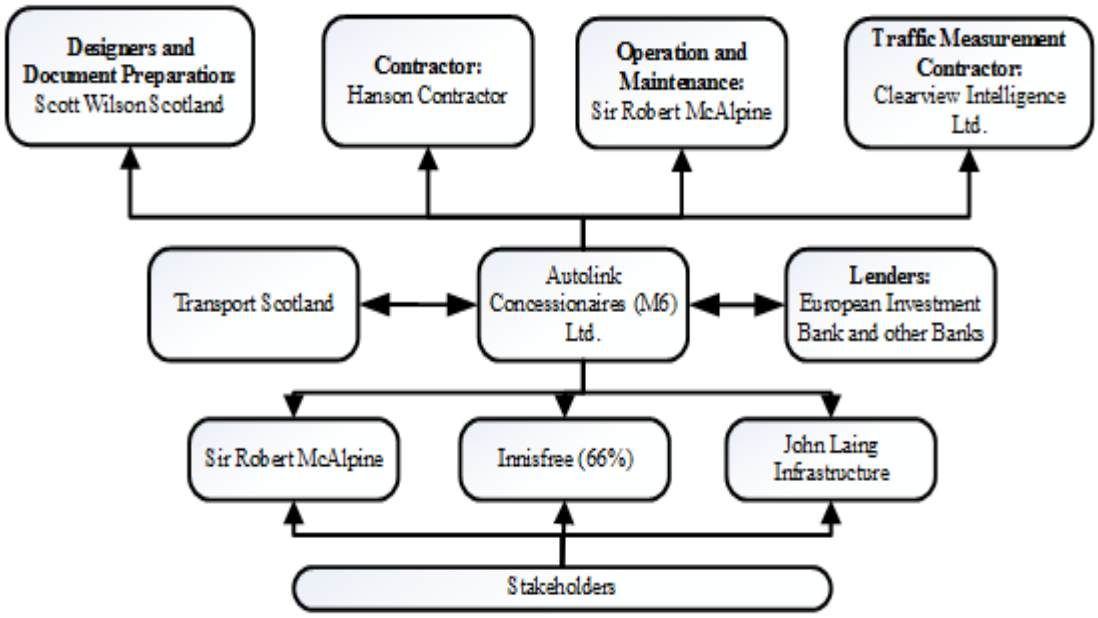


Figure 6.5: Organisations Involved in the CS5 Contract

This road is different from the M6 toll road in England, though it shares the same name with that of England, it is an un-tolled road called the Scotland M6 DBFO (EIB, 2007). XY9-Pri outlines that the road spans all the way from Birmingham in England to Glasgow in Scotland and has its historical roots dating back to the time it was known as the M74. There are three shareholders of this road project, and this includes Sir Robert McAlpine, Innisfree and John Laing Infrastructure as indicated in Figure 6.5. Moreover, XY9-Pri notes that although it is confusing and somehow impossible to distinguish between the M6 and the M74 as the name M74 was also retained by the Scottish government to be used for the road; the M6 DBFO road spans to the English border and connects the M74. XY9-Pri corroborates this, by stating: “When the contract was set up, it was part of the process to make the M6 run from Glasgow to Birmingham, which is why it is called the M6 DBFO. It is confusing, but it is known as the M74". Furthermore, and according to XY8-Pub, the project is necessarily a DBFO and extends to a length of 90km long of two dual-lane motorway hard shoulders. These go from junction 12 of the M74 Scotland road down to the Scottish border and the M6 axis, 90 km, which represents the current motorway.

The current motorway includes all new works for the project including the 60km of the entire length of the road along the Eco-branch junction, which provides access to the whole network. In addition to this intersection, the new works include the M74 DBFO road project in Scotland, which reached completion in the year 1999. XY9-Pri divide the construction aspect of the works into three central section’s that are completed one after the other. The first 30 km was constructed as part of the first phase of the project while a further 30 km road length to the south of the built section, and another 30 km to the north of the M74 DBFO road project. These roads are part of the upgraded section. However, since the completion of these constructions and upgrading works

in 1999, there has been consistent maintenance and renewing or resurfacing of the road network in the context of the activities required for the operation stage of the road network.

The contract start year was 1997, and the road becoming operational in 1999 with an expected completion date of July 2027. Thus, the project currently stands at 20-year duration with a 30-year concession period, and it indicates a two-third completion level of the PFI DBFO project. XY8-Pub and XY9-Pri agree that there are renegotiations occasioned by the evidence of specific changes to the contract.

6.3.5.1 *CS5 Renegotiations*

XY8-Pub and XY9-Pri acknowledge the existence of minor changes and variations leading to few instances of renegotiations on the CS5. According to XY8-Pub, this is on minor additional works requirements such as barriers and railways, flooding and change in climatic and weather conditions. XY8-Pub outlines: *"Yes, I can give you some examples of this, but those that apply as I said are minor drainage, small signage, minor safety barrier, and sub-flood mitigation works."* XY9-Pri agrees with this submission and comments: *"To be honest, there have been very few. I think because the DBFO is quite a new concept, I think the clients have been very wary of making any changes. So, even when it doesn't make sense, they stick very rigidly to the project agreement."* The changes made on this project do not necessitate significant renegotiation, which indicates that renegotiations experienced on this road project are minor and insignificant.

XY8-Pub further substantiates this by stating: *"So to date; we have not had many renegotiation instances."* Indeed, the minor renegotiations that occur on the project, according to both interviewees, took place at the contract renewals stage when some changes take place during the operation and maintenance period. More importantly, XY9-Pri indicates that the project has less to do with renegotiation; renegotiation is on the leading factors or reasons rather than the DBFO contract. According to XY9-Pri, the motive behind the minor renegotiation experienced on this project, which emanates from the insistence of the client, i.e. Transport Scotland, was politically motivated and borders on the desire, by the members of the parliament, to renegotiate the terms of the contract to meet constituency demands. Some changes are occasional at the insistence of the SPV.

Furthermore, XY8-Pub state that the outcome of this minor renegotiation of the DBFO road project has been satisfactory to the public sector. These are because there was strict compliance with the terms of the contract, which made no allowance for changes or variations. Therefore, no action was required after the renegotiation because there had been no negative impact on the contract sum. The costs are a lump sum and are on a one-off payment with very few recurring costs. Thus, the changes to the project do not impact the payments made by the client to the

concessionaire or increase the concessionaire's profit and the contract duration amongst other things. These further substantiates previous suggestions that renegotiation does not necessarily have to affect VfM criteria or project objectives negatively.

XY9-Pri also agrees with XY8-Pub: *"the fact of the matter is that there has been no renegotiation. In the client's view, they quite perceive that DBFO is quite an expensive way to procure construction. I mean, it is the only way they can get money to fund the project at the time, but it is quite an expensive mechanism. Therefore, for that reason, they do not want to spend any more money, and so they do not want to change anything because of the risk as that may expose them to more cost. So, everything is the same."* Though, there is the suggestion that there have been no amendments to the contract deliverables of cost and time because of client's non-disposal to contract renegotiation and refusal to renegotiate the terms of the contract. The findings from the respondents, however, indicates that cost and time remain the same due to client efforts at ensuring that no overruns are arising because of changes to the contract, which may be regarding standards and specifications. Summarily, changes and renegotiation incidences during the implementation of PFI road projects can be avoided to ensure that there is the achievement of the budgeted cost and specified time during execution of the project plan. However, the minimisation or avoidance of renegotiation and changes during the implementation of PFI road projects should not be the only solution to the problem of inadequate or non-achievement of VfM at renegotiation.

Also, XY8-Pub and XY9-Pri further agree that the respective stakeholders (i.e. client, SPV, lenders and users are happy with the results of the renegotiation. However, XY8-Pub outlines that there have been minor complaints from users regarding minor maintenance issues, such as minor defects on the roads, rather than on the overall quality of the roads. The few renegotiation incidences have not had any significant impact on the achievement of VfM. The revenue of the project has been affected by the recession, which necessitates changes to the financial model because of the variance experienced between the actual traffic and the assumed growth rate of traffic in the financial model. According to XY8-Pub, the incorporation of these changes does not change the terms of the financial model but reflect the same principle and characteristics of the financial model.

Conclusively, XY8-Pub and XY9-Pri agree that there are no general and specific VfM targets defined during the strategic implementation stages of the contract. The non-inclusion of VfM marks at these phases of the project may be due to the standards required for the works and because all aspects of the concession were frozen and do not allow for contract renegotiation at the contract formation stage. XY8-Pub indicates that there are procedures for measuring the success of renegotiations regarding whether the achievement of VfM. The responses received from XY9 contrasted with those of XY8-Pub regarding the establishment of the renegotiation

criteria at the inception of the contract and indicated that there was no procedure adopted when assessing the minor renegotiation experienced regarding the achievement of VfM. This submission corroborates XY1-Pub opinion and suggests that there is a need for the definition of renegotiation criteria at contract inception to foster the success of VfM efficiently and effectively.

VfM is not measured at strategic renegotiation points, as claimed by both parties in the contract on this project. XY8-Pub and XY9-Pri determine that necessary measures should be adopted to ensure that VfM achievement during the renegotiation stage. One of the rules, according to XY8-Pub and XY9-Pri, is that the variations and changes should be made to ensure cost neutrality or savings and to foster the achievement of VfM. Also, there is a need to establish VfM as the basis of the decision to renegotiate the contract, while also ensuring that all the parties in the renegotiation have adequate concession renegotiation experience.

Also, there is a need to establish a benchmark, which is on industry standards that follows a competitive process. Sets of indices are, however, advised to be placed against the parameter to allow for accurate estimation and evaluation. A productive collaboration and regular discussion between the contracting parties and partners at the inception of the contract is beneficial. Another measure, recommended by these respondents, is that the project stakeholders' profits should be distributed evenly throughout the project lifecycle to ensure the achievement of the whole life cycle cost as described in the contract. The establishment of necessary restrictions in the agreement regarding what is allowed and what is not authorised is considered helpful and will go a long way in preserving the VfM defined at inception. These measures support the suggestions of Guasch et al. (2014) to address renegotiation challenges to ensure the achievement of VfM.

6.4 CROSS-CASE ANALYSIS

This section presents the analysis of the case studies based on the data collected from the nine respondents from both the public and the private sector. The discussion of the findings is premise on the objectives defined in Chapter 1 of this thesis.

6.4.1 Renegotiation Characteristics and Types

The findings of this study reveal the respective stages of PFI (DBFO) road projects that are characterised by renegotiations on the case studies and the year that the contract commenced including the year that the first renegotiation takes place. Details regarding the experience of each of the case studies as indicated by the individual respondents are in Table 6.2.

Table 6.2: Renegotiation Type and Stage of Occurrence

S/N	Case Study	Stage of Occurrence	Contract Start	Year of 1st Renegotiation
1	CS1	Operation and Maintenance	2004	2010
2	CS2	Construction	2009	2012
3		Construction	2009	2012
4	CS3	-	2003	-
5		Financial close of the contract	2003	2003
6	CS4	Operation and Maintenance	1997	2010
7		Operation and Maintenance	1997	2010
8	CS5	Operation and Maintenance	1997	1999
9		Operation and Maintenance	1997	1999

Key: CS1: Case study 1. CS2: Case study 2 CS3: Case study 3. CS4: Case study 4. CS5: Case study 5.

Also, the findings of these case studies reveal that renegotiation occurs on average, three years from the contract start date, which is usually close to the end of the construction or shortly after the beginning of the operation and maintenance, as indicated in Table 6.2. The only exception is found in CS3 where one respondent demonstrates that renegotiations occurred shortly after the financial close during the implementation of the contract, which suggests that the renegotiation falls within the construction stage. Thus, the type of renegotiations that occur in these case studies, as shown in Table 6.2, agrees with the literature, which states that the infrastructure construction contract falls under intra-deal renegotiations, which occur during the implementation period of the contract (Salacuse, 2000).

Renegotiation in infrastructure contract such as PPP contract in most instances does not occur before the financial close; neither does it happen at the end of the concession contract, i.e. post deal renegotiations. Though, renegotiation may occur at the end of a concession contract during the defect liability period between the public and private partner about issues that may surround the residual value required for the transfer of the project to the procuring authority. The literature has identified that underestimation of risks premised on inadequate knowledge, resources and capabilities by the parties to manage them effectively may lead to increased costs, project delays and services which fail to deliver value-for-money to the community (Ng and Loosemore, 2007). When the risks affect the residual value of the construction product at the end of the partnership, either party may seek to renegotiate terms of transmission of the residual value, take, for example, PPP road network quality and maintenance level. However, renegotiations and changes to the contract occur too often or early in the concession contract process, which suggests that the results or outcomes of the renegotiations may be affected because of the early renegotiations and changes. Though, incidences of renegotiation cover every stage of the PPP project.

These case study findings further corroborate the literature, which states that most PPP contracts, especially in the road sector, are renegotiated within a few years after the financial close (Engel et al., 2014a). As indicated in the case studies, CS1 renegotiations occurred in 2010, which was six years after the contract start date. Both respondents of CS2 and CS4 agree regarding the renegotiation experience of 2012 and 2010 respectively, which in both cases are within the first three years after the contract start date. Respondents to CS5 also indicate that renegotiation experience began two years from the contract start date. However, the respondents from CS3 did not provide any details regarding renegotiations, which may be because of the existence of more changes to the contract, rather than a renegotiation of the contract (See Appendix 9).

Since contract renegotiations are on good intentions, the findings suggest that renegotiations may take place within the contract at the advanced stage of project implementation as opposed to the early stages of the agreement. However, the prevailing renegotiation situation needs to be examined to define and establish necessary measures that could discourage initial change requests through the incorporation of change modalities into the contract.

6.4.2 Factors Leading to Renegotiation

Diverse factors have led to the renegotiation of the identified case studies. Change in the standard of works is one of the most commonly mentioned factors that influence the renegotiation of the road concessions, being mentioned by eight out of the nine respondents, i.e. 89% of the sampled population. Changes to standards of works are recognised by all the respondents in the case studies, excluding XY9-Pri, and it includes all associated work to the improvements, extensions and upgrading of the road concessions as indicated by the respective interviewees. These changes could include CCTV, speed cameras on the highway and other facilities installed on the road infrastructure concession. Other factors prominent factors leading to the renegotiation of road concession projects among which is the addition of road assets. The acquisition of road assets can be additional works introduced by one or both primary stakeholders. Changes to the scope of the work and response to the provisions of the original contract are also factors identified in three case study projects.

Also, the results of the data collected reveal that one respondent only identifies some of the individual factors out of the total nine respondents, which suggest that the factors identified by a single respondent are non-critical factors leading to the renegotiation in comparison to other factors identified. These factors include adverse weather seasons that may be due to the winter months, political motivations to meet constituency demands, poorly written contracts and previous experience of other DBFO road projects, which are: environmental, political, design and related contractual factors respectively. The findings of the responses in these case studies reveal that the answers provided by XY2-Pri and XY3-Pub in CS2 are consistent, as shown in Table 6.3.

Table 6.3: Factors Leading to Renegotiations

S/N	Factors Leading to the Renegotiation	Case Study Projects/ Respondents									Freq.	Rank
		CS1	CS2		CS3		CS4		CS5			
		XY1-Pub	XY2-Pri	XY3-Pub	XY4-Pub	XY5-Pri	XY6-Pri	XY7-Pub	XY8-Pub	XY9-Pri		
1	Changes in standards of works as stated in the specification e.g. Technology such as CCTV	√	√	√	√	√	√	√	√		**8**	1
2	Addition of road assets e.g. new works.	√	√	√	√				√		**5**	2
3	Change in scope of works		√	√					√		**3**	3
4	Response by the parties to provisions of the original contract			√		√			√		**3**	3
5	Need to ensure a safer road for travelling public						√		√		**2**	5
6	Change in pricing and service			√					√		**2**	5
7	To provide VfM benefits for the public			√			√				**2**	5
8	Changes to government legislation and regulation									√	**1**	8
9	Adverse weather season, e.g. winter months									√	**1**	8
10	Political reason to meet constituency demands									√	**1**	8
11	Poorly written contracts	√									**1**	8
12	Previous experience of other DBFO road projects					√					**1**	8
	Total	**3**	**3**	**6**	**2**	**3**	**3**	**2**	**6**	**3**	**31**	

However, there is an indication that respondent XY3-Pub of CS3 and respondent XY8-Pub of CS5 possess sound and substantial knowledge regarding the factors leading to the renegotiations in comparison to other respondents in the remaining case studies. The number of reasons stated by these respondents as shown in Table 6.3 provides evidence that they are more aware of what led to the renegotiation. Factors leading to the renegotiations of these case studies, as revealed in the results of the interviews are shown in Table 6.3. Summarily, the factors, which can lead to the renegotiation of road concessions and include changes to standards of works, additional road assets and changes in the scope of the works amongst other things, as explained in the following subsection:

6.4.2.1 *Changes in Standards of Works*

XY1-Pub in CS1 attests that changes in standards during the implementation process occurred because of changes to technology: *"But obviously, technology changes very quickly, and the way the contract was written did not account for that very well. To comply with the contract, they will be renewing old technology that didn't suit our needs".* This old type of technology in the opinion of XY1-Pub include CCTV whose standard dates to 1998, which in the opinion of XY1-Pub, had changed from the specification of standards CCTV that was made in the year 2017. XY4-Pub corroborates this submission and further states that: *"It is on standards and the current practice. It is to try to keep up with current standards and best practice".* The current practice and standards are assumed to be the accepted standards in the industry. Experience reveals that PPP projects are long-term contracts, which take between 25-30 years to complete.

XY7-Pub further give credence to changes in standards of works as the leading renegotiation factor: *"Because the new standards are trying to make the road more consistent with the standards that are operating on the rest of the strategic road network."* The essence of the renegotiations in CS5 is to keep up with the current and best standards, due to the long duration of the concession contract and obsoleteness of specified materials and components standards. Although at the inception stage of PPP projects in the UK, contracts are defined in a rigid format, which makes it practically impossible to amend any terms during implementation. XY7-Pub substantiate this submission as follows: "The contract does not recognise any change in standards as such because the contract was agreed to the standards that were in vogue at the time."

Moreover, XY6-Pri corroborate the submission of XY7-Pub on CS4 as follows: *"As I said, we are locked in the 1996 standards by Highways England".* Hence, most of the early case studies have their set standards without making any provisions for the renegotiation of standards during the implementation of the project. XY6-Pri reaffirms XY7-Pub statement: *"Yes, there are changes in standards, and we introduced those changes in 2009, and we negotiated it with Highways England to modify the contract to introduce the change in standards".* Therefore, changes in standards begin to set in many years after the road concession, as shown in CS4, where there was weakness inherent in the initial contract regarding performance and VfM. Meaning that most renegotiations in PFI (DBFO) road projects in the UK involve changes to the standards of works.

6.4.2.2 *Addition of Road Assets*

For instance, XY3-Pub in CS2 indicates: *"For the latter upgraded sections, we change the DBFO and added assets that were not part of the original contract. Therefore, there is a need to renegotiate the main contract".* The addition of assets was identified as a leading renegotiation factor, which corroborates XY1-Pub claim that this was one of the reasons for the minor renegotiation that occurred in CS1. Other respondents, i.e. XY2-Pri and XY3-Pub, also agree that the addition of assets has a degree of influence on the renegotiation of the road concession projects.

A change can be declared for either the removal or addition of assets. The removal of assets may be caused by some reasons, which may include obsoleteness of assets because of time, as identified by XY1-Pub. XY3-Pub indicates that while there is a change declaration for the removal of assets by the contracting authority as in the case of CS2, there is a reduction in the cost of the project. However, there has been the introduction of new assets, which has led to an increase in the value of the projects. Thus, the addition of assets, which constitutes additional works in the concession project, was identified in three of the five case studies. The responses to these case studies reveal that there are consistencies in the answers provided by the respondents in CS2 as shown in Table 6.3. XY1-Pub corroborate the reasons given earlier for the renegotiation and states that: *"To comply with the contract, they will be renewing old technology that didn't suit our needs. So, we decided to take it out"* These indicates that the removal and addition of assets can necessitate renegotiation, as outlined in the literature (Sarmento, 2014).

6.4.2.3 *Change in Scope of Works*

The scope of the works, according to the respondent's discussion, relies on the extent and magnitude of the work agreed during the inception of the project and detailed in the contract. XY2-Pri agrees that changes to the scope of works are one of the main factors leading to the renegotiation as follows: *"The fact that the scope of work change from what was originally intended makes that renegotiation slightly more complicated when drawn out than what was originally anticipated".* These suggest that the scope of work could change during the implementation process of the road concession and could necessitate renegotiation. XY8-Pub agrees with XY2-Pri and XY3-Pub by expanding on the notion that the contract agreement can influence the changes that can be made to the scope of work: *"The contract is under code and agreement with Transport Scotland, and that affected the scope of the works and obligation".* Thus, the provisions of the contract, as stated by a clause, could necessitate changes to the scope of the works.

6.4.2.4 *Response to the Provisions of the Original Contract*

XY2-Pri outlines the renegotiation incidences in the CS2: *"It was always put in as an option in the contract, but it was never or not in detail, there is not to be a renegotiation of the contract".* There is the implication that although renegotiation was envisaged as a possibility and envisaged in the original contract, which necessitated the renegotiation; a detailed description of its modalities was not stated as explained that renegotiation should be avoided as far as possible. However, the contract underwent renegotiation based on the contract clause introduced, which made provision for it. XY2-Pri highlights: *"There is a process in the contract for the strategic changes procedure. Any other type of change that occurs has been envisaged and has a process within the original contract. Whether they are a change in the law, a change of standards, etc. Highways England stipulates them all".* These findings show that there is usually a change and renegotiation description in the contract, which outlines the modalities for a decision regarding contract renegotiations, as indicated by the respondents in the CS2 as shown in Table 6.3.

6.4.2.5 *Need to Ensure a Safer Road for the Travelling Public*

XY6-Pri also indicates that the renegotiation, which occurred in CS4, was to ensure that road users and members of the public derived utility from the road output and achieved VfM for the use of the road. VfM is demonstrated by the low level of lane closures and the number of disruptions to service users, as the concessionaires ensured that there would be a minimum level of service disruptions to road users, and all the stakeholders especially the client at renegotiation targeted this objective as part of the most significant goal of the private concessionaire.

6.4.2.6 *Change in Pricing and Service*

Concerning changes in prices and services XY3-Pub states: *"In some sections, we have removed the hard shoulder which is essentially in changing the way the Special Purpose Vehicle (SPV) can provide services in the respective locations. So, that was a change in pricing and service".* The modalities and procedure for service provision were changed and revised. Because of these changes, there was also a change in the basis for tender, which necessitated renegotiation in the CS2 as stated by XY3-Pub.

6.4.2.7 *To provide VfM Benefits for the Members of the Public*

There is an agreement by XY2-Pri regarding the existence of guidelines to assess the respective changes, which constitute the reason for renegotiation requests by the responsible stakeholder and must be followed to achieve VfM. This guideline as stated by XY2-Pri is as follows: "*Each change has a reason. There is a reason for each change to take place. In every case, there will be a benefit. A VfM change on the network. So, concerning actual change, there will be VfM criteria set and achieved. Then the actual renegotiation will always cost neutral".* Hence, the

implication of this is that there is the need to establish factors leading to renegotiation and to ascertain the renegotiation of specific objectives defined by the public sector. In the case of CS2, the basis for granting renegotiations is on cost neutrality conditions, to meet the VfM aim of the procuring authority.

6.4.2.8 *Other Factors Leading to Renegotiation*

There are other factors identified in Table 6.3, which are considered by the respondents as leading to the renegotiation of the case studies. The assumption is that these other factors may not be significant to the stakeholders considering the number of respondents that indicated that they are relevant to their projects. These other factors, in order of their prominence, include the need to make the road more consistent with the standards that are operating on other strategic road networks, changes to the legislation, regulation, and adverse weather season, e.g. winter months etc. However, these factors, as shown in Table 6.3, are observed to fall within the regulatory and legal considerations, environmental factors, political factors and design factors.

Consequently, the findings of the responses in these case studies reveal that there are consistencies in the answers provided by XY2-Pri and XY3-Pub in CS2 as shown in Table 6.3. However, the responses given by other respondents concerning the reasons necessitating renegotiation do not seem to agree, in some instances, with the findings of the literature. The literature identifies regulatory and design factors as the prominent categories of factors leading to the renegotiation of road projects in a PPP road project environment (Please see Table 3.4 in this thesis). The regulatory and design factors having a high level of importance include weak regulatory framework; varying types of tariff regulations; governance and regulatory effectiveness; inaccurate estimation of traffic levels; misallocation of traffic risks and poorly written contracts (See Table 3.4 of section 3.6).

Hence, the findings of the literature differ from the empirical results and indicate that regulatory, design, political and contractual category factors are the principal factors, which can lead to the renegotiation of PPP road projects by their significance. Summarily, the factors influencing renegotiations of PPP road projects can differ from one road project to another as observed in Latin American countries where renegotiations were all motivated by varying factors, which are distinct from the findings of this empirical study, as shown in Table 6.3. Therefore, there may be may be variance in the renegotiation outcomes from one project to the other because of the differences in the factors prompting the stakeholders to renegotiate the PPP road projects.

6.4.3 Initiator of Renegotiation

The case study findings, concerning the initiation of the renegotiation as shown in Table 6.4, reveal that six of the respondents indicated that the public client (i.e. procuring authority) was the initiator of the renegotiation of four out of the five case studies. The findings suggest that most of the renegotiation requests are at the insistence of the procuring authority. However, both respondents in CS5 agree that the public and private sector parties initiated the renegotiation. The only contrasting opinions were those given by both respondents in CS4, i.e. XY6-Pri and XY7-Pub, which indicated that the public client and the private partner were the initiators of the renegotiation. This submission may be correct since both stakeholders are only speaking from their personal experiences on the projects, as both parties may jointly initiate the renegotiations. Hence, the initiators of the renegotiation may be the public client or SPV or both public client and SPV in each instance of renegotiation as shown in Figure 6.4.

Table 6.4: Initiator of Renegotiation

S/N	Renegotiation / Change Initiator	Case Study Projects/ Respondents									Frequency
		CS1	CS2		CS3		CS4		CS5		
		XY1-Pub	XY2-Pri	XY3-Pub	XY4-Pub	XY5-Pri	XY6-Pri	XY7-Pub	XY8-Pub	XY9-Pri	
1	Public client	√	√	√	√	√		√			**6**
2	Both public client and SPV								√	√	**2**
3	SPV						√				**1**
	Total	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**9**

Table 6.4 shows that the client mostly initiates renegotiation requests; the reason for this may be to fulfil the VfM objectives defined in the contract. The results of the renegotiation initiator substantiate some of the findings within the UK context regarding the initiators of renegotiations and change requests: *"Nearly all changes originated with a request from the public sector rather than from the private sector contractor or because of a change in law"* (Hasselgren et al., 2014). In contrast, Cruz, and Marques (2013b) identify more private sector-led renegotiations in Portugal PPP road projects. These suggest that there are variations regarding the initiator of renegotiation requests across countries, including the instances of both changes and renegotiations respectively. These empirical findings reveal that the public sector is the common renegotiation initiator, which coincides with the literature of UK PPP renegotiation studies.

PPP renegotiation studies in other countries, where the private concessionaire typically initiates renegotiations have the experience of non-achievement or poor achievement of VfM, especially in the public sector (Engel et al., 2014b; Cruz and Marques, 2013b). Therefore, the primary stakeholders' renegotiation initiative and the motives for the renegotiation have a lot to do with

the VfM achieved during the renegotiation of road concessions. Hence, renegotiation of concession projects should not be founded on opportunistic tendencies of the private partner towards attaining personal benefits to the detriment of the public-sector client value for money objectives (Engel et al., 2014b; Bi and Wang, 2011). Therefore, renegotiation should be cooperative, initiated by the public sector and agreed by the private partner, or both, as in the case of UK PFI (DBFO) road projects, where there are records of achievement of VfM at renegotiations initiated by the procuring authorities.

6.4.4 Main Impacts of the Renegotiation

The value for money criteria has been identified in chapter 5 of this thesis to encompass the variable cost, quality of service delivery, duration, SPV profit, whole life cost (WLC), and user's satisfaction etc. (Public PPP Malaysia, 2009). The renegotiation of PPP infrastructure projects has had an impact on the VfM criteria (Carbonara et al., 2014; Sarmento, 2014). Fourteen VfM criteria are the basis for assessing PPP infrastructure projects during renegotiations (See subsection 4.7). The interviewees show that there is an agreement concerning the impact of the renegotiations, which are related to CS1, CS2, CS3 and CS4 respectively. Only XY8-Pub in CS5 indicated that the renegotiation impacted the performance-based payment mechanism. The empirical study, therefore, revealed that the renegotiation mostly has an impact on construction cost and performance-based payment mechanism. The smallest effect of the renegotiation was found to be regarding whole life costs and construction duration as shown in Table 6.5.

Table 6.5: Main Impacts of the Renegotiation on VfM Criteria

S/N	**Renegotiation Impacts**	**Case Studies/ Respondents**									**Freq**	**Rank**
		CS1	CS2		CS3		CS4		CS5			
		XY1 -Pub	XY2 -Pri	XY3 -Pub	XY4 -Pub	XY5 -Pri	XY6 -Pri	XY7 -Pub	XY8 -Pub	XY9 -Pri		
1	Construction cost	√	√		√		√				4	1
2	Performance based payment mechanism		√		√		√		√		4	1
3	Concession duration		√		√		√				3	3
4	Competition that provides fair value		√		√		√				3	3
5	Concessionaires profit		√				√				2	5
6	Users satisfaction		√				√				2	5
7	Private sector mgt. skills& expertise		√				√				2	5
8	Quality of service delivery				√		√				2	5
9	Construction duration		√								1	9
10	Whole life cycle cost						√				1	9
	Total	**1**	**8**	**0**	**5**	**0**	**9**	**0**	**1**	**0**		

In these case studies, respondents XY2-Pri and XY6-Pri identified that renegotiations have a more significant impact. The most significant effect of renegotiations is the cost and the variation in the cost of construction, which borders on the technical stage and borders of changes in standards, specifications and scope of work. Although, the findings in Table 6.5 determine otherwise and include construction costs, performance-based payment mechanism, concession/construction duration and quality of service delivery.

There is a suggestion that the factors leading to renegotiation at the technical stage of project development (i.e., construction stage) may have a direct impact on the criteria of costs at the construction stage of the PPP projects. These coincide with the XY2-Pri statement: *"The benefit of Skanska, my parent company, was that for example with the later upgrading sections, which was the £360Million additional worth of construction works. The added worth of construction works was to the construction joint venture (JV), which was 50% to Skanska. Skanska, therefore, has additional works there, but the additional work cannot be connected to the SPV services. What we have generated is additional construction value, which cannot be attributed to the concessionaire".* The statement of XY2-Pri, therefore, suggest that the SPV has not benefitted nor had the profit increased to the detriment of the public sector as shown in Table 6.6.

Table 6.6: Case Studies Cost and Time Differences

S/N	Project Code	Respondent Code	Project Location	Estimated Cost of Construction (£) M	Cost of Construction to Date (£) M	Cost Variance (£) M	Time Variance (Months)	Cause of Variance
1	CS1	XY1-Pub	Wales	101	100.7	0.3	6 months early	- Minor changes and renegotiation of the projects. - Project objective of cost reduction strictly adhered - Renewals, which sticks to contract cost and time provisions
2	CS2	XY2-Pri	England	982.9	1,343	360.0	No time variance.	Changes in the scope of work from what was initially intended, i.e., the later upgrading sections was an additional worth of construction works that constitute an addition to contract scope. The renegotiation was slightly more complicated than what was initially anticipated.
3		XY3-Pub	England		1, 133	132.5	On time.	- New tasks involving the management of the road, i.e. operate and maintain the toll plaza and to collect the toll on behalf of the client. - Additional works were culminating in additional capital investment, which necessitates other payments, which was not envisaged in the original contract. -. Where a change is declared to remove assets, there is a reduction in the cost of the project. So, where we have introduced new assets, there has been an increase in the cost of the projects.
4	CS3	XY4-Pub	England	250	250	No cost variance	On time	No difference because of payment of a fixed fee for changes in standards occasioned by obsolete specifications
5		XY5-Pri	England		Estimated cost of construction achieved	No cost variance	On time	The 519 changes in standards as requested by the client do not necessitate amendment of the contract terms, e.g., risks, prices and changes are envisaged and included in the original contract.
6	CS4	XY6-Pri	England	935	1,0005	70.0	6 months early	A total of 200 changes, which constitute additional works instructed by the client and successfully introduced by the SPV.
7		XY7-Pub	England		-	No cost variance	On time.	No variance, the work executed was within the premise of the contract without necessarily changing the basis of the agreement.
8	CS5	XY8-Pub	Scotland	170	-	No cost variance	No time variance	-. Additional barriers & handrails, which were included in the contract -. Variations occasioned by flood and climate change more than expected necessitate payment for mitigation measures for the floods.
9		XY9-Pri	Scotland		170.0	Zero cost implication to the client	On time	Politically motivated and law enforcement agencies variations regarding customer care signs leading to additional numbers of road signs based on specification requested by the client. That was again another politically driven initiative.

Table 6.6 evaluates the cost and time criteria adopted to assess the impact of renegotiation and change negotiation on VfM. The results of Table 6.6 indicate that there is evidence of reduction additions to cost during the construction stage on three case studies, i.e., CS1, CS2 and CS4 as indicated by XY1-Pub, XY2-Pri, XY3-Pub and XY6-Pri. On CS1, XYI-Pub suggests that there is a cost reduction of £300 million per year during the three years of the construction stage. The reduction leads to a reduction in the contract sum according to the client objective of reducing the value of the project. On CS2 and CS4, however, there are increases in cost because of the introduction of additional works some of which are in the contract. The additions lead to increase in construction value without increasing the cost to the client based on the initially agreed contract sum as shown in Table 6.6. Hence the new and additional works including changes of standards were such that it does not affect the project performance matrix regarding budgeted cost defined at the inception of the contract. All other respondents agree that there is no variance of the expenses and time stipulated in the contract agreement as shown in Table 6.6, which suggest that the renegotiations and changes on the respective case studies have no adverse impacts on the VfM criteria of cost and time, which are essential project performance indicators.

These findings further suggest that additional works are at the construction stage and tend to affect the costs of construction. These finding, therefore, indicates that there can be the achievement of VfM at the construction stage of a project, where the factors leading to renegotiation are properly evaluated to ensure that there is no adverse impact on the construction costs. Hence, renegotiations impacts can be by positivity and negativity as indicated by XY2-Pri: *"But there are lots of examples as to whether the improvements schemes that have been suggested and implemented by the concessionaires or by the O & M Joint Venture (JV). The improved ways of working whether it has had a positive impact on the travelling public, safety initiatives etc."* Construction duration and whole life cycle costs are, therefore, the least impacted VfM criteria when compared to other VfM criteria in Table 6.5. However, the maintenance costs experienced some minor differences, as identified by XY2-Pri; these findings agree with XY2-Pri in CS2: *"The renegotiation has not profited any of the parent companies or Connect Plus itself. It has not adversely impacted it".*

XY8-Pub also indicates that the level of renegotiation experienced in CS5: *"So to date, we have not had much renegotiation. Based on that, Transport Scotland has been much happy with the prices submitted to the carrier on those changes".* The implication is that the cost attributable to the renegotiation experience in the CS5 project remained the same throughout implementation. Thus, a renegotiation could either have had a positive or adverse impact on the value for money criteria established at the inception of the contract (Sarmento, 2014). All the findings from the case studies indicate that the renegotiation experience has an impact on the identified VfM

criteria, except in the case of respondents XY3-Pub, XY5-Pri, XY7-Pub and XY9-Pri, which do not indicate the several implications of renegotiation during the interviews.

The literature, however, establishes construction costs as the most impacted VfM criteria, while the whole life cycle cost is amongst the least affected standards of VfM (See Table 3.5). This study, therefore, corroborates the literature by revealing that road concessions renegotiation in most instances impact construction costs. The impact of renegotiation on construction cost could be a result of the numerous changes necessitating amendments to the contract at the construction stage of the project development. The findings suggest that cost is a useful criterion for measuring the achievement of VfM at renegotiation. XY1-Pub attests the target for VfM evaluation by stating: *"we are looking at cost reduction perspectives. Cost reduction is the main target. We are not looking at it (i.e., outcomes) regarding extra performance".* Based on this renegotiation experience, as explained by XY1-Pub, contract renegotiation does not necessarily have to impact the VfM criteria negatively; as the findings reveal that there is the implementation of the contract based on the budget specified on the respective case studies. There is also an indication that there is the achievement of VfM as stated in the agreement.

Furthermore, renegotiation of road concessions has been found to have an adverse impact on the concessionaire profit and the user's satisfaction (Acerete et al., 2010). The findings of this empirical study reveal that the whole life cycle, construction duration, concessionaire's profit, quality of service delivery, private sector management skills and experience and user's satisfaction are amongst the least impacted by VfM. In other words, the renegotiation does not seem to affect the profit of the concessionaire, quality of service delivery, construction duration and whole life cycle (WLC) etc. XY2-Pri substantiates the impact of the renegotiation on the profit generated by the SPV in the concession project as follows: *"The renegotiation has not profited any of the parent companies or SPV. It has not adversely impacted it".* This submission implies that the impact of renegotiation in CS2 is neutral and benefits the travelling public and users, not the SPV. These means that renegotiation of PPP road concessions does not necessarily have to have an adverse impact on concessionaire's profit and user's satisfaction as claimed in the literature (Sarmento, 2014; Acerete et al., 2010; Baeza and Vassallo, 2010). The whole life cycle (WLC) assessment may be difficult to assess since the case studies are still in the operation stages.

There are, therefore, contrasting positions regarding the impact of the renegotiations on the project VfM criteria. Instances of renegotiation in Portugal, Spain and some important Latin American countries reveal that renegotiations have had adverse effects on the PPP infrastructure project VfM criteria (Sarmento, 2014). Sarmento (2014b, p.125) highlights the concerns regarding the impacts of renegotiation on the individual standards of VfM: "high incidence of

renegotiations even shortly after contracts were signed hurt both the PPP's performance and efficiency and could undermine the credibility of PPP projects. Sarmento (2014) and Acerete et al. (2010) indicate that the experience of PPP renegotiation, especially in the road sector, has negatively impacted cost, quality and user's satisfaction. Evidence of these renegotiation impacts is in high road user charges, including higher payments by the public clients through subsidies or several lump sum payments, particularly in shadow tolling arrangements.

These empirical studies reveal that there are no substantial renegotiation impacts on the VfM criteria. XY2-Pri states: *"to be honest with you, regarding the penalties or bonuses that we have been paying through the payment mechanisms, there has been no impact because of those changes".* Based upon this submission and the numerous findings, one can assume that the renegotiation of the road concessions has not adversely impacted the VfM variables. Although, the findings of the cases studies reveal that there is no evidence of impact on contract cost on CS2. However, in all the remaining case studies, there is a positive impact of the renegotiation on construction cost. There is some evidence of cost savings in CS4, as indicated by XY6-Pri; this suggests that cost is a good criterion for measuring VfM achieved at renegotiation. XY1-Pub attests the cost target regarding VfM evaluation by stating that: *"we are looking at cost reduction perspectives. Cost reduction is the main target. We are not looking at it (i.e., outcomes) regarding extra performance".* Based on this renegotiation experience, as explained by XY1-Pub, contract renegotiation does not necessarily have to impact the VfM criteria negatively, as the findings reveal that there is an on-budget implementation on the case studies which as outlined in the provision of the contract. There is also an indication of the achievement of the specified quality.

6.4.5 Outcomes of the Renegotiations

The outcome of these case studies revealed that there is no change to the cost of the concession contract as indicated by all respondents in CS1, CS3, CS4 and CS5. However, the respondents in CS2 both agreed that there were cost savings, which occurred due to the removal of assets. XY3-Pub substantiates the removal and addition of assets, which can lead to an increase or decrease in the cost of construction as follows: *"So, regarding the outcomes, when a change is declared to remove assets, there is a reduction in the cost of the project. So, where we have introduced new assets, there has been an increase in the cost of the projects".* Besides, evidence from all the case studies reveals that the project has been completed to date and within the stipulated contract duration. The only respondents, XY6-Pub in CS4 and XY8-Pub in CS5, agree that there was an increase in concessionaire's profit and minor changes to the payments of the concessionaire as shown in Table 6.7.

Table 6.7: Outcomes of the Renegotiation of the PFI (DBFO)

S/N	Renegotiation Outcome	CS1	CS2		CS3		CS4		CS5		Freq.	Rank
		XY1 -Pub	XY2 -Pri	XY3 -Pub	XY4 -Pub	XY5 -Pri	XY6 – Pri	XY7 -Pub	XY8 -Pub	XY9 -Pri		
1	Contract cost remain the same	√			√	√	√	√	√	√	**7**	1
2	Completion within contract duration	√	√			√		√	√	√	**6**	2
3	Quality and performance achieved	√	√			√	√	√			**5**	3
4	Cost savings occasioned by assets removal	√	√	√			√				**4**	4
5	Neutral (same) profit by concessionaire		√			√			√	√	**4**	4
6	Timely completion of construction and on schedule		√	√			√		√		**4**	4
7	Good service delivery brings users complement			√	√		√				**3**	7
8	Few complaints from users and members of the public			√	√		√				**3**	7
9	Increase in contract cost due to addition of assets		√	√							**2**	9
10	Decrease in contract cost due to inclusion of new standards				√	√					**2**	9
11	Positive outcome achieved in terms of risk	√				√					**2**	9
12	Fosters good relationship between the client and SPV				√		√				**2**	9
13	Increase in concessionaire's profit						√				**1**	13
14	Changes in payments made to the concessionaire								√		**1**	13
	Total	**5**	**6**	**5**	**5**	**6**	**8**	**3**	**5**	**3**	**46**	

These findings imply that the outcome of the renegotiations and changes regarding contract cost demonstrates VfM for the public client and achieves the VfM objectives (i.e. profit) of the SPV as defined. The minor differences in payments to the SPV and an increase in concessionaire's profit in CS4 are due to the additional works and are a result of the renegotiation of the road concession. Thus, the results shown in Table 6.7 above seem to agree with Table 6.6, which indicates that the impact of renegotiation is significant regarding meeting the defined construction cost which will benefit the client (i.e. there is a neutral cost of construction as well as savings in the construction cost of the DBFO's).

The reason for the achievement of VfM concerning the criteria of the cost is stated by XY8-Pub in CS5 as follows: *"The difference is minor because the changes are minor. So, there is a minimal impact on the cost".* The concessionaires in these case study projects (i.e. CS1, CS3, CS4 and CS5) usually deliver the projects to the budgeted cost as outlined in the contract, which supports

the previous argument of XY2-Pri: *"Any renegotiation intends to make it effectively cost neutral. Party will neither benefit nor be disadvantaged by it. Therefore, you are effectively pricing the change. Seeing what the impact is and making sure that it is not affecting either party profit from the budget or cost perspectives. As in the case of Highway England, all of our contract changes are always negotiated where possible to have a cost-neutral attribute".* These imply that renegotiation is usually based upon the cost described in the contract from the inception and regarded as fixed at renegotiation, meaning no changes can the budgeted cost as shown in Table 6.7.

There are different outcomes in the individual incidences of the renegotiation as shown in Table 6.7. However, respondent XY9-Pri indicates that there is no renegotiation occurrence, i.e. changes leading to amendments of the terms of the original contract. Instead, there are claims by respondents regarding some specific changes during the implementation of the project, particularly in CS5. Nonetheless, XY4-Pub voices the aspects of the project that underwent renegotiation: "No, nothing will change since it will be quite expensive for the client. It's a lump sum based on traffic flows and safety performance". Similarly, XY9-Pri state*: "the fact of the matter is that there has been no renegotiation. In the client's view, they quite perceive that DBFO is quite an expensive way to procure construction. I mean, it is the only way they can get money to fund the project at the time, but it is quite an expensive mechanism. So, for that reason, they do not want to spend any more money, and so they do not want to change anything because of the risk as that may expose them to more cost".* The inherent risks imply that the client tries, as much as possible, not to make renegotiation or variation requests because of the potential impact such applications may have on the concession cost.

Therefore, to ensure the realisation of the fixed cost defined in the contract and possibly ensure cost savings, renegotiation was kept to a minimum in CS3, and there was no renegotiation in CS5, as identified by respondents XY4-Pub and XY9-Pri respectively. Thus, discussions on the outcomes of the renegotiations are on the findings of all other case studies excluding XY4-Pub and XY9-Pri. However, these road concessions undergo changes of standards, amongst other changes, as previously explained in subsection 6.4.2. Therefore, the results of the road concession renegotiation are evaluated to ascertain the outcomes of the renegotiation with the results based on the VfM criteria shown in Table 6.7.

Another important outcome is that the projects are within the contract duration: CS1, CS2, CS3, CS4 and CS5 respectively. There is the achievement of quality and performance prescribed in the specification in CS1, CS2, CS3, CS4 case studies. Apart from these high-ranking outcomes of the road concession renegotiation as established in Table 6.7, other results, which have a low frequency of occurrence, are indicated in CS5 and CS4. These are minor changes in payments

made to the concessionaire and an increase of the concessionaire's profit. These findings suggest that the planned payments by the public sector and the benefit of the SPV remain unchanged, which contrasts the literature findings which indicate an increase in government payments and SPV profit in road concessions (Acerete et al., 2010).

The outcomes of the renegotiation, as indicated by the individual respondents regarding the criteria of costs, duration, quality and performance, government payment to the SPV, risk, profits, users' satisfaction and the entire partnership reveals the existence of positive results. To substantiate Table 6.7, respondents XY2-Pri and XY3-Pub show that an additional contract cost of £360 million emerged because of the renegotiation of the projects, and this renegotiation was due to the addition to the scope of the work agreed. There was an increase in the contract sum because of the additional jobs carried out on the project. The increase in the contract sum, due to other works, supports the findings outlined by XY3-Pub, who states: *"where assets are removed from the contract, there is a reduction in cost and where there is the addition of assets, there are increases in costs of those aspects of the project."* The outcome of the renegotiation has been found to increase and decrease on some occasions, based upon the addition and removal of assets at the technical stage of the road concession implementation.

Moreover, the 30-year concession duration for most of the case study projects remains the same, with the project still possessing the expected delivery date. XY2-Pri reinforces this by stating: *"the construction was early and, on the budget, and to date, there have been some minor issues and some nagging about some defects rather than the overall quality".* As a result, VfM is found to be achieved by the public sector. There is a need to link the results of the empirical studies with the literature, to compare the own findings and draw conclusions based on the results; the literature's position does differ from these empirical findings. Sarmento (2014) notes that there is a high degree of scepticism regarding the ability of PPP to deliver VfM; these submissions are concerns expressed in other classical literature (Acerete et al., 2010).

The literature has accurately identified the outcomes of the PPP road projects renegotiations regarding the VfM achieved for the respective stakeholders within the road sector (Sarmento, 2014, Engel et al., 2006). The findings of this literature reveal that VfM has eluded PPP road projects, as the outcome of the renegotiations recorded in PPP road projects does not seem to favour the public sector. The users and the procuring authorities are not fully satisfied at the end of the renegotiation, as stated in the literature (Sarmento, 2014; Baeza and Vassallo, 2010). The findings of this empirical study, however, contrast the literature findings and suggest that government payments to the concessionaire do not attract significant changes, e.g. subsidies or direct payments, which serve as financial rescue intervention on the projects.

One of the reasons why there is the achievement of VfM regarding cost criteria have is because of the non-increase in government payment and SPV profits. Renegotiation can be considered to achieve VfM in the public sector; government payments to the private concessionaire must reflect the terms of the contract and the gain of the SPV must remain within the threshold agreed by the parties at the contract formation stage. Furthermore, penalties for non-performance should be minimal to ensure the continuation of the project. Moreover, literature, which looks at the renegotiation experience of essential countries in Latin America and other countries, has succeeded in determining the findings required for addressing the profitability of the concession to ensure profitable returns to the concessionaire. However, fewer contributions have been made concerning the provision of a robust PPP that will result to the achievement of public partners' objectives and are non-detrimental to the public sector (Sarmento, 2014; Acerete et al., 2009; Guasch et al., 2008). Thus, renegotiation can achieve favourable outcomes for the public sector while not necessarily seeking to maximise profit for the SPV to the detriment of the public sector.

6.4.6 Value for Money Enquiry on the Renegotiation

The literature establishes that VfM can be evaluated throughout the lifecycle of the project based on the criteria defined in the contract. The VfM criteria for measurement include, but is not limited to, construction costs, operation and maintenance costs, project finance costs, the whole life of the contract, concessionaire's profits, construction duration, concession duration,

quality of service delivery and users' satisfaction etc. (Public PPP, 2009). The several VfM criteria have been adopted for assessing the renegotiation of PFI (DBFO) road projects to achieve VfM (Demirag et al., 2004). The findings of this study agree with the literature that private sector management expertise and skills, cost, time, quality, profit and risk perspectives amongst other things are the VfM criteria usually adopted for the VfM assessment of road concessions renegotiation. The case study interviews based on the value for money inquiries are in Table 6.8.

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Table 6.8: Details of the Value for Money Enquiry

S/N	Value for Money Enquiry	Respondents									Answers		Rank
		XY1-Pub	XY2-Pri	XY3-Pub	XY4-Pub	XY5-Pri	XY6-Pri	XY7-Pub	XY8-Pub	XY9-Pri	Y (%)	N (%)	
1	Is there evidence of VfM achievement for respondents' company?	Y	Y	Y	Y	Y	Y	Y	Y	Y	100	0	**1**
2	Is definition of renegotiation criteria necessary at contract inception?	Y	Y	N	Y	Y	Y	Y	Y	Y	89	11	**2**
3	Is there evidence of VfM satisfaction for other stakeholders?	Y	-	Y	-	Y	Y	Y	Y	Y	78	0	**3**
4	Is there any difference in VfM at inception and VfM renegotiation?	N	N	N	N	N	Y	N	Y	N	22	78	**4**
5	Does the renegotiation guideline help in VfM achievement?	-	Y	Y	-	Y	Y	Y	-	Y	67	0	**5**
6	Do you measure the VfM achieved at strategic renegotiation points?	-	N	N	Y	N	Y	N	N	N	67	22	**6**
7	Are there procedures for measuring VfM success at renegotiation?	Y	Y	N	-	Y	Y	Y	Y	N	67	22	**7**
8	Are there measures for VfM achievement?	Y	N	Y	-	-	Y	Y	Y	Y	67	11	**8**
9	Are there strategic actions to address deviations from VfM targets & VfM at renegotiation?	Y	Y	-	-	-	Y	-	-	Y	44	0	**9**
10	Are there guidelines for assessing renegotiation for VfM achievement?	N	Y	N	Y	Y	Y	Y	N	Y	67	33	**10**
11	Is there definition of Specific VfM targets?	Y	Y	N	-	N	Y	N	N	N	33	56	**11**
12	Are VfM targets defined at strategic stages of PPP?	N	Y	N	-	N	N	Y	N	N	22	67	**12**

The principal findings, as stated in Table 6.8 indicate that all the respondents in the case studies agree that there is evidence of the achievement of VfM for the individual organisations, as well as other stakeholders that are internal and external to the projects. No information was given regarding VfM by respondents XY2-Pri and XY3-Pub; instead they provided perceptions of stakeholders that are external to the project in CS2. Both the procuring authorities and the SPV are happy and satisfied with the VfM achieved and the outcome of the renegotiations. These findings suggest that VfM can be reached at the renegotiation stage of PPP road projects if there is a precise definition of the renegotiation criteria at the inception of the contract, for adoption at

the implementation stages, especially during the technical development stage of the road projects. The reason for choosing the technical phase of the road concessions is because the literature identifies that the factors leading to the renegotiation of the road projects border on the technical stage of the implementation.

The results further reveal that in seven out of the nine interviews there was no difference between the VfM described at the beginning of the concession and VfM achieved at renegotiation. The fact that all the interviewees agreed that there was evidence of achieving value for money for their respective organisations corroborates the fact that there is no significant difference between the VfM expected and VfM achieved at the end of the renegotiation. Six out of the nine respondents, which represent 67% of the total, indicated that there are renegotiation guidelines that have assisted in the achievement of VfM recorded in the case study projects. The remaining 33% of respondents did not suggest the existence of renegotiation guidelines; this indicates that specific guidelines can assist in the achievement of VfM at the renegotiation stage of PPP infrastructure projects.

Although, the literature agrees that there are financial, technical and economic requirements that are defined based on the objectives and goals of the procuring authority at inception for the assessment of the project during implementation (Kumaraswamy and Zhang, 2001). These requirements constitute the benchmark for assessing PPP projects for VfM achievement. However, the literature does not identify specific guidelines that can be adopted during renegotiation to ensure that VfM is achieved in the UK road concessions (Hasselgren et al., 2014). Specific measures that can be taken to ensure the achievement of VfM at the renegotiation stage are proposed in the context of PPP infrastructure projects (Guasch et al., 2014). Hence, the research can be used to help develop a framework to provide guidelines, based on the experiences of the respondents in the case studies, to foster the achievement of VfM.

Six out of the nine interviewees determine that there are usually no VfM targets defined at the strategic stages of the implementation of projects, nor are there any specific VfM targets set at the inception of the contract to assist in the assessment of VfM achieved at renegotiation. Though, VfM requirements are defined from the point of the evaluation of PPP projects during the implementation stages (Kumaraswamy and Zhang, 2001); the evaluation of VfM is compiled to ensure that the payment made by the government in the case of the shadow toll for the service provided by the concessionaire is justified and based on the project benefits or VfM achieved (Muvirimi, 2012). All the submissions in the empirical studies provide insights that foster an understanding of the relationship between renegotiation and VfM.

XY5-Pri further states *"that there is usually no renegotiation consideration in the financial model which as developed in February 2003 at the time of the signing of the contract."* Though, XY2-

Pri agrees with XY5-Pri by determining: *"There is a process in the contract for the strategic change procedure, which implies that the procedure for effecting change is outlined in the contract, while considerations for renegotiation are not specified or outlined in the contract".* These further agree with the submission of XY1-Pub: *"The contract that we are looking at now, i.e., the CS1 is one of the first PFI's in the UK, and it did not have anything specifically about renegotiation, and it's basically at the mercy of the contract holder".* The literature has identified the need for the stipulation of renegotiation approaches, criteria and a contract renegotiation process at the contract formation stage based on the problems of VfM usually encountered at the renegotiation of PPP projects (Sarmento, 2014; Guasch et al., 2014).

Further findings show that the respondent observed no variance regarding VfM achieved at the end of the renegotiation in comparison to the VfM defined at inception. Some of the respondent's statement reveals that there is no basis to link the VfM to the implementation of PPP road projects. However, the literature states that there is the need to assess the PPP projects during implementation, based upon the defined requirements, i.e. technical, economic and financial (Xiong Zhang, 2014; Montecinos and Saavedra, 2014; Kumaraswamy and Zhang, 2001). Nevertheless, quantified criteria regarding costs are undescribed during the strategic implementation points of PPP road projects renegotiation stage. Instead, there is the development and adoption of the financial model by the procuring authority as stated by XY2-Pub, XY3-Pub and XY5-Pri in CS6 respectively.

The importance of the financial model is described by XY3-Pub as follows: *"There are lots of lines or mandate in the financial model that are perhaps as clear as could be to help future renegotiations".* The situation implies that a financial model has been carefully designed with renegotiations in mind to address any emerging questions or challenges that could mitigate the achievement of VfM. The findings suggest that the financial model, as adopted in the case studies, ensures cost neutrality where the variables or criteria of VfM and cost of governance amongst other things remain fixed throughout the project implementation and particularly at renegotiation. This notion supports the literature, which states that one of the measures used to ensure VfM at renegotiation, is to ensure that the amendment of the contract agreement must preserve the net present value (NPV), which should always be zero throughout the implementation stages of PPP projects (Sarmento, 2014; Guasch et al., 2014; Bain, 2010).

67% of the respondents indicate that VfM has been found to be measured based on the financial model described during inception by the primary stakeholders. All the respondents further indicated that there are measures to ensure VfM renegotiation and that there is a definition of specific targets for VfM, e.g. construction costs and duration in PPP road projects. These targets and measures are identified by XY7-Pub as follows: *"So, you have to have some measure against*

something like what is the total cost, capital and operation cost over the lane kilometre or something like that. Also, compare it against the other to know how much it cost per lane km on the local road and how much does it cost on a motorway. And you have to do it over the longer period than just the year". XY2-Pub and XY3-Pub also agree with the above, which indicates that the financial model stipulates cost requirements and provides a basis to evaluate and assess a road concession project for VfM achievement.

Only four respondents agree that there are strategic actions to address deviation from the VfM targets defined and VfM achieved at renegotiation. However, XY6-Pri indicates that most DBFO roads procured after 1997 have targets to ensure the achievement of VfM: "All other DBFO contracts have, but we have not. They have targets for payments. We are paid based on the level of traffic using the road. However, another DBFO contract has targets based on the speed of traffic, travelling on the network. We have a situation where if we take a lane out or get a lane closed, we get charged. We are penalised for it. Now at the start of our contract, we have an allowance in our budget of about 26 million GBP for lane closure charges". These, therefore, indicates that lane closure charges could be determined as one of the targets to ensure VfM at DBFO road concessions renegotiations.

The measures adopted during the implementation of the road concession for VfM achievement mainly involve working on the project plan. XY6-Pri describes these as follows: *"we have a financial model for the project that is constantly, and that is on the price of the project plan and what we do is we work within that project plan".* XY2-Pri also supports this statement by identifying the cost neutrality element of the financial model as the basis for the VfM measure: *"Well again, given the cost neutral element of it, we don't. We have a VfM criterion that needs to account for all changes, works and interventions including the actual renegotiation. There are no VfM criteria because you are still going back to the idea of cost neutrality".* These imply that the requirements defined regarding the financial model may be regarded as criteria for the assessment of VfM, as stated by XY2-Pri. The literature corroborates the recent submission, which says that the project can be done during the implementation process to ascertain whether it meets or surpasses the requirements, i.e. financial, technical and economic etc. (Sarmento, 2010; Kumaraswamy and Zhang, 2001).

The cost, as outlined in the financial model, is said to be neutral in the case of concession renegotiations to allow the verification of VfM through the adoption of the calculation incorporated in the financial model. XY3-Pub substantiates this as follows*: "we have financial internal governance processes which we have to go through to evidence the process we have gone through to demonstrate VfM. Again, VfM is demonstrated through evidence of actual cost incurred and through evidence of assumed cost in the financial model. And if there is any*

difference, then it's been assumed as the catch up between the two costs". According to XY2-Pri, XY3-Pub, XY6-Pri and XY8-Pub respectively, the financial model is crucial. XY1-Pub supports the cost of the main criteria of the VfM measurement: *"Oh no. we are looking at cost reduction perspectives. Cost reduction is the main target".* Any project that achieves the defined and budgeted cost throughout the entire life-span is usually considered to deliver VfM for the public sector.

Furthermore, XY2 reveals that VfM is usually not defined in a way in the contract; therefore, the initiation of PFI transactions in road infrastructure projects by the client at the inception of PFI projects usually considers its evaluation. In fact, XY4-Pub agrees with XY2-Pri by stating follows: "there are expectations and assumptions about what will be delivered based on the level of investment." However, XY2-Pri notes: *"to date, there has not been a comprehensive task to determine whether VfM has been realised in the first seven years of the contract."* These occur mainly after renegotiation and estimating whether the variance has subsided between that defined at inception and the VfM achieved after renegotiation, or during the implementation of PFI (DBFO) road projects. The changes and renegotiations are introduced into the contract on a cost neutral basis, i.e. the assumption is that the VfM is consistent throughout the contract and does not vary with changes as indicated by XY3-Pub.

According to XY4-Pub, the users and other stakeholders outside the partnership are unable to provide a valid answer on the VfM achieved at renegotiation; this is because they are not aware of the changes and the renegotiations made during the implementation of the contract. They may be able to comment on the partnership output regarding quality and service delivered. However, the client, SPV and lenders are all happy with the VfM achieved in CS2. The claim by XY4-Pub further explains this: *"I think it's highly likely that Highways England has achieved VfM. The SPV up to this date has also achieved the objective of no better no worse. I also think regarding the lenders; I believe the bank has reached their goals because they've signed up the changes".*

Also, XY2-Pri states that the targets set for VfM at inception for the strategic points during the implementation of the project, particularly at renegotiation are as follows: *"A host of objectives against which we set ourselves is from the construction perspectives. Bottom line figures for that will be programmed and valued".* The programme is then measured using the time taken, the cost incurred, and quality achieved based upon output specification. Moreover, achievement of VfM during the implementation process of the contract at the construction stage according to XY2-Pri is: *"we outperformed regarding the programme. Regarding value, most of the projects investigated were under budget due to innovation and efficiencies that were in the contract, which is evident, especially during the construction phase".* These, therefore, implies that innovation and efficiencies during the management of the construction process of road concessions

contribute a great deal to the VfM achieved at the renegotiations, which take place. Hence, efficiency and innovation are essential during the implementation of road concessions to ensure the achievement of VfM.

Specific metrics defined at the inception of the contract can be adapted to measure the success of PFI (DBFO) road projects regarding the health and safety of the workers and road users, the performance of the service men and the VfM targets achieved at the construction stage of the projects. Some VfM objectives that are usually defined and documented in PFI (DBFO) road projects are diverse and depend on the role of the respective stakeholders on the project. For instance, XY2-Pri indicates, with regards to actions taken in CS2 that *"A host of targets against which we set ourselves is from the construction perspectives regarding cost, duration, and quality of output, health, and safety of workers and performance of those involved in the project."* For XY1-Pub, however, cost reduction is the primary VfM target considered at the inception of the contract and during the implementation and renegotiation process of CS1.

The extra performance is not the focus of a project, as acknowledged by XY1-Pub and XY3-Pub; any requirement for extra performance will attract additional cost and lead to cost increments, which is against the principle of cost neutrality and the fixed nature of the concession contract through the principle of the financial model. The VfM target is on the plan, budget and programme, as outlined by the respective respondents, which constitutes the stakeholder's objectives. Having considered all PFI (DBFO) road projects, there is evidence to show VfM achievement in all the case studies. However, for other stakeholders in the concession contract, 78% of the respondents indicate that there is no significant difference between VfM criteria and the outcomes of the renegotiation. The findings reveal that the PFI (DBFO) road projects renegotiation in the UK has been a positive experience and has significantly improved the achievement of the VfM as described in the original contract. These findings suggest that contract renegotiations do not necessarily have a negative impact on VfM criteria. The case studies empirical results contrast with some literature findings (Guasch et al., 2014; Sarmento, 2014; Gifford, 2014; Xiong and Zhang, 2014; Acerete et al., 2010; Baeza and Vassallo, 2010).

Renegotiations of road concessions in Spain indicates higher charges for road users (Acerete et al., 2010; Baeza and Vassallo, 2010), which in most instances necessitate subsidies as financial rescue measures. Consequently, the subsidies usually erode VfM achieved for the public sector. There are also examples of financial rescues in failing projects through renegotiations in Portugal, which involved the adjustment and rebalancing of the road concession projects (Sarmento, 2014; Xiong, and Zhang, 2014). Renegotiation experiences of 54.7% of transport projects in Latin America reveal that the concessionaires are beneficiary based on the outcomes that are premise on the cost criteria (Guasch, 2004). Reside and Mendoza (2010) state that most renegotiations of

PPP projects in Asia resulted in increased subsidies and financial compensation for the concessionaire companies. USA PPP project renegotiations could have been unfavourable to the public sector without the institutional framework, which protects the interest of the public sector from private opportunism through service provision guaranteeing (Gifford et al. 2014). Therefore, all the evidence in the supporting literature shows that not all renegotiation instances have achieved VfM for the public sector and contrasted the findings of this research.

6.4.7 Contract Mechanisms for Payment

There are mechanisms for payment defined as part of the contract, which serves to ensure the achievement of VfM during the implementation of the agreement, especially during renegotiation and in some instances change negotiation in PFI road concessions. The interviewees identified these mechanisms about each of the case studies as shown in Table 6.9.

Table 6.9: Contractual VfM Mechanisms

S/N	VfM Contractual Mechanism	CS1	CS2		CS3		CS4		CS5	
		XY1-Pub	XY2-Pri	XY3-Pub	XY4-Pub	XY5-Pri	XY6-Pri	XY7-Pub	XY8-Pub	XY9-Pri
1	Lane occupation charges								√	√
2	Key performance indicators (KPI's)								√	
3	Lane closure charges						√			
4	Journey time penalty bonus		√							
5	Safety performance adjustment bonus					√				
6	Critical incidence bonus		√							
7	Proactive management bonus			√						
8	Financial internal governance processes			√						
9	Congestion management					√				

These mechanisms are adopted for payment to the concessionaire and are used as criteria to assess the project for VfM achievement based on the client's objectives. XY6-Pri identifies lane closure charges, which is a measure to ensure the availability of the road for users on a regular basis. The SPV is charged a fee when there is any lane closure during its operational hours; this discourages the execution of additional works, which may necessitate the closing of the road during the day so that the road can be available for the users. Most of the maintenance works are done at night to allow for the routes to be possible during the day. XY1-Pub also agrees with XY6-Pri and XY2-Pri that there are bonuses and penalties paid to ensure the realisation of VfM on the DBFO road projects, particularly regarding the criteria of time, cost and quality. The respondents identify lane occupation charges as the contractual VfM mechanism adopted in CS5 and shown in Table 6.9. The payment mechanism, which sets out the level of required works before payment requests

can be approved and certified. According to this mechanism, the client, when reaching a threshold or level of expectation, can only make payment; if these falls below the requirements, there will be a deduction from the monthly fee. XY2-Pri, XY3-Pub, XY5-Pri, XY8-Pub and XY9-Pub recognise that payment to the SPV is as stated in the financial model and it is on the stipulations agreed in the contract, which are either on a monthly and yearly basis. Governments base this figure on the number of vehicles using the road, which pays for all the projects. However, there are some exceptions to the payment mechanisms as explained by XY5-Pri*:"The payment mechanisms are by congestion management and not by shadow tolls"*. It is the measurement of traffic and average speed of traffic in the sections of the road, which must be within the target rate for payment. XY5-Pri opines that there is no contractual mechanism used on the project: *"No contractual mechanisms. Only the financial model".*

Regarding the financial model, this model for financial expenditure has been introduced into the payment mechanism through the instrumentality of the financial model. The financial model reflects the amount of money to be paid to the contractor, the nature and details of payments, including the implementation stage when the payment is due to be made. Based on this statement, there is a suggestion that the congestion payment is distinct from the fee required in the financial model. Another mechanism based on the reliability of the journey at some strategic and specific points on the road network. The criteria set for renegotiation based on journey time penalty bonuses as indicated by XY2-Pri and XY6-Pub stipulate that the journey must be achievable over the required distance and within the stipulated speed and time. In the event of non-achievement of the specified range within the specified speed and time, there will be a penalty bonus awarded against the SPV.

Safety Performance Adjustment Bonus is a mechanism, which measures the performance of the road regarding the safety of its road users. Bonus or penalty is awarded to the SPV based on the safety of the road, and whether anyone is killed or seriously injured on the road network. XY5-Pri identifies this mechanism as being adopted by the government for payment to the SPV. The mechanism seeks to measure the response levels about the occurrence of critical incidences on the road network, e.g. accidents, electrical failure and fire. However, it depends on the speed at which the workers can get to the incidence to clear blockages or obstructions that may be on the road network. Under this mechanism, according to XY2-Pri, there is usually a definition of what constitutes a critical incidence. The evaluation of what constitutes a critical incidence is usually done on an annual basis, using more subjective measures, which require a hard-scoring process by an individual panel to establish competency.

Respondent XY5-Pri notes that this mechanism was adopted during the making of payments by the government. The congestion management payment is a payment made based upon the measurement of traffic and average speed of traffic in certain sections of the road. The target set, according to XY5-Pri, must be met before the government can make payment. This payment is distinct from the payment required in the financial model. XY5-Pri identifies two types of payments: *"We have the congestion management which is aimed at keeping the traffic flowing above the targeted speed, and we have a small payment for month safety on the road."*

However, the literature identifies congestion management as a payment mechanism, which is a recent development to the shadow toll payment mechanism adopted on this road project. These imply that there are recent developments targeted to ensure that VfM is achieved for the road users and consequently for the public sector. The financial internal governance process, as identified by respondent XY3-Pub, is required to prove and demonstrate value for money. The internal governance process seeks to explain and highlight, through the evidence of actual costs incurred and proof of assumed price in the financial model, whether VfM is achieved at renegotiation. The goal is to make the cost financially neutral.

Contractual mechanisms to ensure the achievement of VfM during renegotiations are introduced to guide the contractual relationships between the main parties to renegotiation. These mechanisms are in the form of payment terms and other control mechanisms defined at inception for each of the projects to ensure the attainment of VfM (Akbiyikli and Eaton, 2005). However, this differs from one project to another as indicated in the discussions in this chapter. The payment terms, otherwise known as payment mechanisms, have been classified into shadow toll payment mechanisms, availability payment mechanisms and active management payment mechanisms (Soomro and Zhang, 2011; Akbiyikli and Eaton, 2005; Acerete et al., 2010). The respondents identify all these payment mechanisms as the contractual mechanism, which is adopted to ensure the achievement of VfM during the renegotiation of road DBFO concessions. These mechanisms further serve as a basis to evaluate what is paid to the SPV and the VfM implication for the clients.

Furthermore, the mechanisms, as identified by the clients, include: journey time penalty bonus, safety performance adjustment bonus, critical incidence bonus, lane closure charges, proactive management bonus and financial internal governance processes etc.; all of this corroborates the literature regarding payment mechanisms, which are adopted during PFI (DBFO) road projects. The essence of the adoption of this payments mechanism is to ensure that the objectives of the public sector are attained when securing utmost satisfaction for the users of the road network. Therefore, the payment mechanisms, which may include the monthly fixed fee payments in the financial model, payment conditions for monthly fee payment as stated in the financial model, journey time penalty bonus, are all incorporated into the provision of the contract to ensure that

VfM is achieved for the public sector. For that reason, these mechanisms are adopted by the client in the case studies to ensure that the users benefit from the projects and that the concessionaire is adequately rewarded for achieving the VfM objectives set by the client. Hence, the mechanisms seek to deliver fair reward for all stakeholders regarding VfM.

6.4.8 Measures to Ensure the Achievement of Value for Money

The measures used to ensure the achievement of VfM at the renegotiation of the road concessions are shown in Table 6.10.

Table 6.10: Measures to Ensure the Achievement of Value Money at Renegotiation

Case Studies / Respondent		**VfM Measures Suggested**
CS1	**XY1-Pub**	More focus on the performance indicators. There should be criteria for performance indicators
CS2	**XY2-Pri**	There is a need for a review of all requirements before the formation of the PFI contract
		There is a need to agree fixed fees, profit margins rate of return at the beginning of the contract
		Development of a change mechanism to guide contract implementation over the 30-year period
	XY3-Pub	The change mechanism is to ensure that what was originally agreed is achieved contract completion
		Include a requirement for an open and transparent cost tracking system
		Effective parameter or trust process that allows both parties to understand the impact of any renegotiation
		Developing a set of guiding principles, which define how both parties, can conduct themselves in renegotiation
		Need to build up trust between the parties to ensure that there is no need to check everything at renegotiation
		Need to create a one-team philosophy & adopt a collaborative and analytical approach in contract formation
		Ensuring that the contract is managed in a proactive and collaborative manner
		Defining contract expectations in terms of manner of its administration
		Prescribe precise and significant authorisations during implementations particularly in the event of renegotiation
		Defining in the contract who write the contract system and the stakeholder system to be adopted in the event of renegotiation
CS4	**XY6-Pri**	Establishment of a network board with the responsibility of ensuring minimum level of disruptions to service provision.
		Building a better working, partnering and collaborative relationships in place.

Table 6.10: Measures to Ensure the Achievement of Value Money at Renegotiation (Contd.)

Case Studies / Respondent		**VfM Measures Suggested**
		Ensuring stable team members through proper motivation.
		Ensuring bid review to ensure that opportunistic bid with the intent of renegotiate during implementation is rejected.
		Establishment of standards of performance for SPVs as a requirement for initiating payment for a renegotiation request.
		Need to freeze or place an embargo on the standards for materials, work requirements and the quality of workmanship (amongst others) if necessary.
		Establishment of contract review processes and requirements with the aim of effecting defined or allowable changes to the contract.
		The inclusion of hand-back requirements (i.e. salvage value of the road project or level of depreciation allowed at delivery or handover. However, these must be dictated by the public sector).
		The inclusion of project plan reviews (e.g. every three years) to monitor the performance of the project and particularly of VfM.
		The fixing of penalty points for non-performance with applicable limits to SPVs before contract takeover by the client, etc.
	XY7-Pub	Establish a reasonable comparative baseline between other procurement methods to determine whether we have VfM or not.
CS5	XY8-Pub	There may be a need to devise variations to ensure cost savings and consequently VfM.
		Ensuring that VfM informs the decision to renegotiate the contract.
		Adequate renegotiation experience can be of great help.
	XY9-Pri	Establish a benchmark based on industry traces by competitive process, or some sets of indices placed against the benchmark.
		Ensure effective collaboration and discussion between the partners at inception.
		The project gain should be distributed evenly throughout the whole lifecycle to ensure the achievement of the contract cost.
		Establish necessary restrictions in the contract regarding what is not allowed.

The experience of XY1-Pub illustrates that there is a need for an appropriate description of the performance of the proposed road investment regarding the criteria required, and the basis for the measurement of the performance criteria during the life of the concession. XY1-Pub also recommends an excellent review of the concession project as one of the measures to ensure VfM at renegotiation. The purpose of the evaluation according to XY6-Pri is to ensure that opportunistic bids, with the intention to renegotiate the contract by the SPV during the implementation of the project, are discouraged. Moreover, XY6-Pri identifies that the inclusion of project plan reviews, for instance, project review every three years of the concession will be

appropriate to monitor the performance of the project and to ensure the achievement of VfM. These imply that specific criteria to guide the renegotiation of road concessions, such as the definition of performance indicators and review processes will assist in ensuring the achievement of VfM during project implementation.

The experiences of interviewees XY3-Pub and XY9-Pri further indicate that there is a need for a responsive guideline at the inception of the contract as it will aid future renegotiations. XY4-Pub says: *"I think a contract will need a set of guiding principles that will define how both parties can conduct themselves in renegotiation regarding philosophies, objectives guiding principles and I think that will work."* These principles, defined by XY3-Pub, are to: *"create a one team philosophy; we need to adopt a collaborative approach and an analytic approach to the making of the contract."* Also, XY9-Pri states that the competitive process should be adopted when measuring VfM. The reference should then be the criteria for assessment of VfM at strategic implementation points.

All the interviewees agree that there is a necessity to define criteria for renegotiation at the inception of the PPP contract. Although, such rules, according to XY1-Pub, was not explicitly established at the beginning of the deal and does not say any terms of renegotiation and how to go about it; it is essential for PFI (DBFO) contracts to state the criteria for renegotiation before the commencement of the project. These will serve the interest of the client very well towards achieving VfM. Furthermore, XY2-Pri, XY3-Pub, XY6-Pri, XY8-Pub and XY9-Pri acknowledge the existence of a specific contractual payment mechanism, which is designed in the contract, to ensure that there is the full achievement of VfM for the client.

The interviewees have referred to these contractual payment mechanisms as contractual VfM mechanisms. For example, monthly fixed fee payment in the financial model, payment condition for the monthly fixed costs, journey time penalty bonus, safety performance adjustment, critical incidence bonus, and proactive management bonus, which are all contractual VfM mechanisms identified by the respondents in the individual case study project. XY2-Pri recognises the need for agreed fixed fees and profit margins rate of return, which should be included in the contract at inception. Also, there should be a change mechanism to guide contract implementation over the 30-year period to ensure that the agreement is executed as stated in the contract up to the project completion.

XY3-Pub recommends an open and transparent cost tracking system, useful parameter or trust process as well as the need to build confidence: *"Sure five ways to not get VfM out of the contract is to manage in an adversarial way. It's all about managing the contract in a proactive, collaborative manner, building trust between parties so that you can trust each other".* To address the question of trust, XY3-Pub, XY6-Pri and XY9-Pri further suggest the need for a discursive,

partnering, collaborative and analytical approach in the formation of the contract, which builds a better working relationship between the partners. Moreover, there is a need to define contract expectations regarding the manner of administration at the technical stage, while also specifying the contract authorisations required at the contract implementation stage when the need for renegotiation arises.

Other measures identified by XY6-Pri, include the establishment of a proper management unit to coordinate effective motivation of team members towards the reduction of disruptions on the road network. In some cases, standards of performance should be prescribed, and an embargo of freezing such measures, e.g. materials, work requirements should be placed over a period as required by the public sector. There should also be requirements stated as a clause in the contract, which ensures the sustenance of the value of the road concession to be delivered at the end of the concession period. There should also be a provision in the contract, which ensures that the SPV is rewarded for excellent performance and penalised for non-conformity with prescribed standards.

Interviewees in CS2 and CS5, who are XY2-Pri, XY3-Pub, XY8-Pub and XY9-Pri, reveal that the primary stakeholders usually request for renegotiations only in a situation where it is satisfied the VfM will be achieved for the parties to the renegotiation. In other words, there is a need to ensure that VfM informs the decision of the primary stakeholders for contract renegotiation. XY9-Pri states*: "Because it is quite rigidly drafted we have never been asked to demonstrate value for money."* These suggest that VfM has been rigidly incorporated and built into the contract provisions at inception. Therefore, it is required for the stakeholders to work within the rigidly defined contract that has included the consideration of VfM. Hence, parties must meet the terms of the VfM developed in the agreement, which forms the basis of any changes and renegotiations. XY8-Pub notes that enough experience of road concessions could be useful in achieving VfM by the public sector. Therefore, only experienced and competent staff on both the concessionaire and the client's side should be allowed to engage in the renegotiation process.

Besides, XY9-Pri identifies that there is a need to establish a benchmark, which is based on satisfaction derived by the public sector and designed as a basis to measure renegotiations. Necessary restrictions should be introduced into the contract at the formation stage to define what is, and not, allowed at the renegotiation during contract implementation. The measures suggested by the respective respondents to ensure the achievement of VfM is set according to the individual case studies as shown in Table 6.9.

The achievement of VfM for all the stakeholders suggests that VfM can be achieved at the renegotiation of PFI (DBFO) road projects and that all the contracting parties can be satisfied at the end of the renegotiation. XY3-Pub gives credence to this by stating: *"Again VfM is*

demonstrated through evidence of actual cost incurred and through evidence of assumed cost in the financial model. And if there is any difference, then it is being assumed as the catch up between the two costs". Hence, there should be no variance in the VfM achieved for the stakeholders regarding the criteria described for each of the variables.

These empirical findings express a different opinion to the literature, which indicates that the experiences of renegotiation in PPP road projects have not addressed the VfM challenges. These challenges led to the non-achievement of the objectives for the stakeholders, primarily the procuring authority objective regarding VfM for users (Sarmento, 2014; Xiong and Zhang, 2014; Reside and Mendoza, 2010; Engel et al., 2009). The reason for these contrasting findings is that the renegotiation results and outcomes differ regarding geographical locations. More importantly, the findings of this study are on renegotiation experiences in the UK, which has adopted PFI for road project delivery since the early 1990's (Debande 2002; Akintoye and Chinyio, 2005). As such, the interviewees are providing information based on the wealth of experience in PFI adoption for road project delivery.

The literature suggests that the renegotiation challenge, which has posed greater VfM achievement problems for the public sector, can only be addressed through the adoption of the strategic actions and measures (Guasch et al., 2014; Sarmento, 2014). The findings of this study corroborate the literature, as suggested by the respondents, that specific measures can enhance the prospects of achieving profitable results for the public sector at the renegotiation of road concessions. Therefore, it is possible to obtain VfM during the renegotiation of PPP road projects through the adoption of measures outlined by the respondents, which is based upon their respective experience in the case studies.

XY3-Pub observes that there is a lack of coherence and clarity regarding the specification of funds included in the financial model. This demerit has hindered the full achievement of VfM during the implementation of road concessions. XY3-Pub further corroborates this submission by indicating that the VfM success recorded needs to be further strengthened to foster the most efficient VfM renegotiation in PFI (DBFO) road projects, while also addressing the shortcomings inherent in the financial model. To achieve this, XY3-Pub states that: "*What we do struggle with is to understand how the financial model apportions money fully. There are many lines or mandate in the financial model that are perhaps as clear as could be to help future renegotiations. So, it might be a line like a toll plaza with a value of it. It does not say what is included in that money. Therefore, it does not include the O & M toll plaza. It does not include the O&M renewals. It does not include the technology. It just a very standardised description of the number next to it but it is not necessarily transparent as it could be to help future renegotiations.*

Therefore, what I would suggest would be a good recommendation for PPP projects going forward will be to be much more transparent, exact cost and financial model from inception that will aid future renegotiations".

The financial model is a model used as a standard to evaluate the expenses on a given PFI (DBFO) road projects and to ensure that the plan is executed based on the financial requirements. The findings from the interviews, especially on CS2 indicates that it is essential to adopt the financial model to ensure that the VfM objectives of the client are realised. Hence, it serves as a robust technique to compare the results regarding the cost expended to the budgeted cost of the project as stated in the contract. Thus, it is necessary for the stakeholders, especially the client to ensure that the financial model is updated annually from the start of the deal to include any changes, revisions or renegotiations to its terms, as stated by XY3-Pub: *"The financial model is updated annually. However, we must change it to what has been agreed in that year. The total cost of the project will take into consideration the increase and decrease each year depending on what changes have been made".* However, XY2-Pri states that the financial model guides renegotiation and it assumes that the actual cost incurred during road project implementation, especially at renegotiation should not exceed the expected price in the financial model.

VfM is possible through the actual cost incurred during implementation, which is less than or equal to the assumed value in the financial model. This cost is fixed and payable to the SPV or concessionaire on the basis stipulated in the contract, e.g. monthly or annually by the performance indicators as identified by XY1-Pub. The adoption of this principle in all the projects is responsible for the positive VfM results achieved in most of the case study projects. The outcome of renegotiation and changes in the case study projects indicate that completion of the projects must occur within budget, period, and must have user satisfaction and expected quality. Thus, renegotiations have had a positive impact on the VfM criteria designed for the project at inception.

The financial model as established in the case studies has set out a strict guideline to adopt in ensuring that renegotiation achieves the VfM objective of the public sector. Conclusively, the respondents' answers suggest measures, which address the problem of VfM inherent in PPP road projects renegotiation. The literature corroborates some of the measures identified as capable of assisting the renegotiation of PPP projects to achieve VfM (Guasch et al., 2014).

6.5 SUMMARY OF THE CHAPTER

The empirical research reveals that the renegotiation of road concessions does not necessarily have to erode the VfM criteria and the VfM objectives of the procuring authority, including the user's satisfaction. Indeed, renegotiation experienced in most of the case studies contributes to the improvement of VfM goals for the stakeholders, particularly regarding user's comfort. Since cost is the primary criteria for the measure of VfM, there should be the development of a thorough financial model, which should be in the contract for use at the beginning of the agreement. The financial model will assist the public and private users to understand how the contract stipulates the apportionment of cost to allow for necessary check and balances during the implementation of the project, particularly at renegotiation. The contract mechanisms for payments and measures taken at the renegotiation and change process are responsible for the positive VfM results achieved for users. Hence, the contract mechanisms for payment have been referred to as VfM contractual mechanisms as they assist to deliver the reliability of journey times, reduce road congestions and avoid lane closures, ensure safety performance across a range of PFI (DBFO) road projects amongst others.

The procuring authority at renegotiation expects that changes, reviews, and amendments conform to the performance, quality, costs and standards stipulated in the financial model, as stated in the original contract. No deviation from the specified VfM criteria established in the agreement. The achievement of the estimated cost should, therefore, be consistent throughout all the stages of the PFI (DBFO) road contracts and should not vary with renegotiation or changes during the implementation of the agreement. The different position of the literature and this empirical study regarding VfM achieved primarily for the public sector suggests that there is a need to underpin these findings further and to develop a philosophy of renegotiation that fosters the achievement of VfM during the renegotiation of road concessions. The VfM renegotiation philosophy seeks to incorporate measures that will enhance optimum achievement of VfM at the renegotiation stage of PPP road projects.

CHAPTER 7 RENEGOTIATION OF DESIGN-BUILD-FINANCE-OPERATE ROAD PROJECTS

7.1 INTRODUCTION

This chapter presents the results and findings of the quantitative data collected through the questionnaire survey. The sections reflect the respective parts of the study administered by objectives 3, 4 and 5 of the research. The goals include the assessment of the factors leading to PFI (DBFO) road projects renegotiation; impacts of PFI (DBFO) road projects for the Value for Money (VfM) criteria; the outcome of the renegotiation of PFI (DBFO) road projects and value for money in PFI (DBFO) road project renegotiation. The findings from each of these sections are from the data analysed and presented in tables, charts, figures and frameworks. The purpose of the questionnaire survey is to confirm further, or identify, any deviations from the findings of the interviews. Moreover, the results will help develop the VfM renegotiation framework for PPP road projects implementation and management.

7.2 PRELIMINARY RESPONSES OF THE QUESTIONNAIRE

The responses provided by the respondents in the introductory part of the questionnaire elicits practical information regarding the respondents, type of PPP, nature of the organisation, the current position of the respondents and number of years of experience of the respondents. These are all explained in this subsection.

7.2.1 Category of Public Private Partnership Stakeholders

There is the evaluation of the individual categories of PPP stakeholders in comparison. The results indicate that 52% of the respondents work in a private company and are responsible for both design and building aspects. They are called SPV or concessionaire because of their dual responsibilities. 28% of the responses received were from public agency representatives, while representatives of the public company responsible for the contracting aspect accounted for 8%. Also, 4% of the answers come from the private organisation in charge of the consulting responsibility for road DBFO projects.

Hence, 56% of respondents are from the private sector, and 36% of responses received are from representatives of the public sector, while 8% of the questionnaires collected are without information, as shown in Table 7.1.

Table 7.1: PPP Stakeholder Type

S/N	PPP Stakeholder	Frequency	Percentage (%)	Rank
1	Private Company Contracting & Consulting	13	52.0	1
2	Public Agency/Client Representative	7	28.0	2
3	Public Company Contracting	2	8.0	3
4	Private Company Consulting	1	4.0	4
5	Without Information	2	8.0	
	Total	**25**	**100.0**	

7.2.2 Current Position of the Respondents

The results of the data analysed indicate that 4% of the respondents are a Managing Director/CEO, General Manager along with other categories of positions respectively. 16% of the respondents constituted Contract Performance Managers and Engineers. The Quantity Surveyors totalled 8%, while Project Managers that are currently serving in the organisations account for 36% of the total survey returned. However, 12% of the questionnaires returned were without information as shown in Table 7.2.

Table 7.2: Current Position of the Respondent

S/N	Current Position of Respondent	Frequency	Percentage (%)	Rank
1	Project Manager	9	36.0	1
2	Contract Performance Manager	4	16.0	2
3	Engineer	4	16.0	2
4	Quantity Surveyor	2	8.0	4
5	General Manager	1	4.0	5
6	Managing Director/CEO	1	4.0	5
7	Others	1	4.0	5
8	Without Information	3	12.0	
	Total	**25**	**100.0**	

7.2.3 Years of Experience of the Respondents

The result of the analysis, concerning the years of experience of the respondents, shows that 20% of the respondents have 10-15 years, 15-20 years and 20+ years of experience respectively. 8% of the respondents have between 0-5 years' experience, while 24% of the respondents have between 5-10 years' experience in PFI (DBFO) road projects as shown in Table 5.6. These findings show that 60% and 84% of the respondents have over ten years and five years experiences respectively in UK PFI (DBFO) road projects.

Consequentially, only 8% of the respondents have less than five years' experience, while 20% have over 20 years' experience of PFI (DBFO) road projects, as shown in Table 7.5. These results indicate that the respondents have significant, rational and comprehensive expertise in PFI road project procurements in the UK construction industry, as outlined in Table 7.3.

Table 7.3: Years of PFI (DBFO) Road Projects Experience

S/N	Number of Employees in the Respondents Organisations	Frequency	Percentage (%)	Rank
1	Between 5 to 10 years' experience	6	24.0	1
2	Between 10 to 15 years' experience	5	20.0	2
3	Between 15 to 20 years' experience	5	20.0	2
4	20+ years of experience	5	20.0	2
5	Between 0 to 5 years' experience	2	8.0	5
6	Without Information	2	8.0	5
	Total	**25**	**100.0**	

7.3 PROJECT SPECIFIC RENEGOTIATION CHARACTERISTICS

As discussed in the methodology section in chapter 5, the questionnaires administered to the public and private sector stakeholder reveal distinct characteristics of the DBFO road projects regarding renegotiation.

7.3.1 Incidence of Road Project Renegotiation

The researcher investigates the road concessions to ascertain the incidence of renegotiation. Of the twenty-two respondents that provided full responses to the questionnaire, thirteen indicated that they could remember a renegotiated PFI (DBFO) road project that they had been involved in, while nine could not think of any renegotiation of road concession that they had possible involvement. Given that nine respondents did not agree that they were engaged in any renegotiation, this confirms the results of the case studies, which indicates that there are few renegotiation instances in road concessions and the renegotiations of road concessions are not common in the context of the UK. Although the respondent's information there may be a question regarding the data provided, due to their non-involvement in renegotiation processes, as the information provided is based on knowledge gained from their current position (See Table 7.2).

As 59% of the questionnaire respondents agree that they were involved in renegotiation, while 41% provide information based on their knowledge of the renegotiation process, without practical involvement in the renegotiation process. The percentages of the respondents suggest that most of the respondents had experience of renegotiation in the UK road concession projects. These statistics put the ratio of respondents with practical renegotiation experiences and those without practical renegotiation experiences at 59:41.

However, the difference between those respondents with renegotiation experience and those without renegotiation experience is not high. The findings suggest that renegotiation experiences vary and are not very common in the UK road sector, which coincides with the literature regarding the few pieces of evidence of PPP renegotiation in the context of the UK PPP projects (Makovsek et al., 2015).

Contrastingly, there is a high level of renegotiations in infrastructure transport projects procured through PPP, in comparison to other infrastructure construction projects in the literature (Estache et al., 2009b; Guasch and Straub, 2009a). However, these studies are limited to individual countries in Latin America and Europe, excluding the UK. Overall, these studies show that the level of renegotiation experiences of stakeholders in the context of UK PFI (DBFO) road projects is not very high, given the responses received from the stakeholders from the two categories of respondents (i.e., public client and private concessionaire).

There are many PFI (DBFO) road projects in the UK; however, only twenty-one (21) projects have been sampled for this questionnaire survey at the central level of governance in England, Scotland and Wales, as explained in the research methodology section (Please see sub-section 5.6.2.2). Thus, forty-one (41) respondents from this 21 case study projects are expected to provide information regarding PFI (DBFO) road projects in the UK. Only seven (7) out of the forty- one (41) respondents from these case study projects gave the names of the DBFO road projects they have had practical renegotiation experience. However, due to the confidentiality of the study, the names of the road projects provided by these respondents remain private and confidential. The reason why others did not divulge the names of these projects may be because of the need to keep their information private and confidential, which coincides with the literature that firms often do not show their renegotiation experiences in PPP projects and usually prefer not to disclose their profits (Sarmento, 2014, Moore et al., 2014).

7.3.2 Characteristic Type of the Renegotiation

The research also seeks to identify the nature of the renegotiation on the PFI (DBFO) road projects. The results of the analysis reveal that eleven (11) out of thirteen (13) respondents that claim involvement in the renegotiation indicates that renegotiation usually occurs during the execution/implementation stage of the contract (intra-deal renegotiation). This finding corroborates the supporting literature as outlined by Salacuse (2000), where most infrastructure construction contracts, including PPP, undergo renegotiation during the project implementation stage. The implementation or execution stage according to Koppenjan (2005) includes the realisation phase, which entails the design and building of the project, as well as the operation and maintenance phase.

Moreover, nine (i.e. 69.2%) out of thirteen (100%) respondents indicated that there was an unexpected incidence which led to the renegotiation. These statistics further reveal that 46.2% of the respondents agree that there are changes envisaged at the inception of the contract, which necessitates a renegotiation of the contract; while 69.2% of the respondents agree that unexpected incidences led to amendments of the agreement. A comparison of these various renegotiations shows that renegotiations could occur during the project execution as expected or unintended by the stakeholders. Unexpected incidence leading to renegotiations is most common in comparison to expected events and most of the renegotiations according to the responses occur after the start of the contract, i.e., after the financial close as shown in Table 7.4.

Table 7.4: Type of Renegotiation

S/N	Type of Renegotiation Experienced	Frequency	Percentage (%)	Rank
1	Renegotiation, which occurs during the period of implementation (i.e. from the design and financial close, build, operation and maintenance) of the contract as stated by a contractual clause.	11	84.6	1
2	Unexpected incidence, which necessitate the revision or amendment of the contract.	9	69.2	2
3	Expected changes, which necessitate the amendment of the original contract	6	46.2	3

Table 7.4 shows that most of the renegotiations occur during implementation from the financial close to the operation and maintenance, which suggest that show that the renegotiation of DBFO road projects are mostly intra-deals (i.e. renegotiation that occurred during the execution of the concession) (Koppenjan, 2005; Salacuse, 2000). This result implies that renegotiation mostly takes place during road concessions, as stated in the literature, after the financial close and during the period of practical execution of the works, i.e. within the stage of construction up to completion and the handover stage (Engel et al., 2014a). Hence, there are similarities between the findings of this study and the literature. Factors Leading to Renegotiation.

7.4 FACTORS LEADING TO RENEGOTIATION

Sections C of the questionnaire also asks questions that elicit information regarding the factors leading to the renegotiation of PFI (DBFO road projects as shown in Appendix 2. The findings of the literature reveal that several factors led to a request for renegotiation by the primary stakeholders of PPP road projects (Guasch et al., 2014; Menezes and Ryan, 2013; Bi and Wang, 2011 and Baeza and Vassallo, 2010).

Essentially, fifty-two factors are from the literature review, as factors leading to renegotiations of PPP road projects (See section 3.9).

There is the classification of the factors into eleven categories (i.e. design, technical, economic, contractual, tendering and bidding, administrative and managerial, institutional, regulatory and legal, political, environmental and social). The fifty-two factors identified from the literature (See Table 3.4) including those from the case studies were integrated into Table 3.4 and form the basis of the instrument used for the second pilot study. The pilot study assisted in refining the designed questionnaire, based on the findings of the literature and case studies. At the end of the pilot study, the respondents were able to identify thirty-seven factors as being applicable and relevant to the UK PFI (DBFO) road projects (See Appendix 2). Out of these thirty-seven factors, thirty-six were found in the literature, while fourteen have traces with the case studies as well as the pieces of existing research. Only one (1) factor was found to be the contribution of one of the respondents in CS5, as shown in Table 7.5. Based on this outcome, the thirty-seven factors were included in the questionnaire (See Appendix 2), and the respondents were asked to answer the questions to show their level of agreement based on the Likert scale.

The analysis of the responses (See Table 7.5) indicates that changes in standards of works, changes in specification and modifications in the scope of the works are the prominent technical factors leading to renegotiations of road DBFO projects. These findings agree with the results of the case studies, as the critical factors, in their respective order of significance, are changes in standards of the works, changes in the specification, the addition of road assets and changes in the scope of the works. Of the fifty-two factors, three are non-critical factors (i.e. opportunistic bidding, e.g. bid submission with the intent to increase prices at renegotiation, error in the bid during procurement, poor evaluation of competitive proposals and lack of transparency in the discharge of managerial duties). Incidentally, two of these three factors are tendering and bidding factors, while one falls under the administrative and managerial category. All the identified may be the reason why these factors are not reflected in the case studies respondents as factors leading to the renegotiation of road concessions, as they are non-critical to the renegotiations that occurred in the case study projects.

The highly critical factors leading to renegotiations fall under the technical category. These are the first three factors in the hierarchy (See Table 7.5). Other significant factors are two contractual factors, one technical factor and one environmental factor, as shown in Table 7.5.

Table 7.5: Details of the Factors Leading to the Renegotiation

S/N	Factors	LR	CS	Category	Frequency	Mean	Rank	Criticality Index
1	Change in the standards of works during the technical development	√	√	Technical	22	4.14	1	VC
2	Specification changes [e.g. change in the standard of technical skills, change in the type of technology]	√	√	Technical	22	4.05	2	VC
3	Change in the scope of works	√	√	Technical	22	4.05	2	VC
4	Additional works during construction [e.g. requirement for extension or widening of the road network]	√	√	Contractual	22	3.73	4	C
5	Additional works during operation & maintenance [e.g. removal and replacement of assets]	√	√	Contractual	22	3.68	5	C
6	Changes in infrastructure design, layout and programme during project execution	√	√	Technical	22	3.68	5	C
7	Environmental impacts	√		Environmental	22	3.27	6	C
8	Managerial initiatives to keep up with current contract standards	√	√	Administrative and managerial	22	2.95	7	MC
9	Changes in pricing and service to be provided as stated in the tender	√	√	Tendering and Bidding	21	2.95	7	MC
10	Social acceptability of user charges by the members of the public	√		Social	22	2.73	9	MC
11	Inaccurate or defective project specifications	√	√	Design	22	2.73	9	MC
12	Archaeological constraints	√		Environmental	21	2.71	11	MC
13	Changes to general price level and transaction costs due to inflation	√		Economic	22	2.68	12	MC
14	Opposition to continuation of the project by the members of the public	√		Social	22	2.59	13	MC
15	Inaccurate estimation of the traffic level forecasts or levels	√		Contractual	22	2.50	14	MC
16	Poorly written contract [e.g. ambiguity of terms and contract details]	√	√	Contractual	22	2.45	15	MC
17	Time overruns for bidding and contract negotiation	√		Contractual	22	2.41	16	MC
18	Political instability occasioned by changes in government or changes in government priorities.	√	√	Political	22	2.36	17	MC
19	Corporate social responsibility considerations	√		Social	22	2.36	17	MC
20	Erroneous change in the basis for tender	√		Tendering and Bidding	22	2.32	19	MC
21	In-accurate estimation of capital cost	√		Design	22	2.32	19	MC
22	Political instability evidenced in contract award shortly before or after elections	√		Political	22	2.32	19	MC

Table 7.5: Details of the Factors Leading to the Renegotiation (Contd.)

23	Changes in economic policy by government [e.g. high or incremental changes to corporate tax and levies]	√		Economic	22	2.32	22	MC
24	Mismatch between the public and private partners objective [e.g. in terms of profit sharing]	√		Others	22	2.27	23	MC
25	Inadequate contract management expertise or knowledge	√	√	Contractual	22	2.23	24	MC
26	Management incompetence [e.g. administrative delays during project execution]	√		Administrative and Managerial	22	2.18	25	MC
27	The need to respect and adopt the overriding interest of major political constituency in the parliament		√	Political	22	2.18	25	MC
28	Defective contract awards criteria or incorrect contractual assumptions	√		Contractual	22	2.14	27	MC
29	Ineffective governance and regulation of the renegotiation process necessitating specific statutory changes to the contract	√		Regulatory/	22	2.14	27	MC
30	Inadequate feasibility studies and ex-ante pre-tender analysis	√		Legal	22	2.14	27	MC
31	Corruption at governance level e.g. awarding contract because of the nationality or affiliation of the concessionaire	√		Tendering and Bidding	22	2.14	27	MC
32	Corruption at governance level evidenced in misappropriation of funds	√		Political	21	2.10	31	MC
33	Ineffectiveness and inefficiency of contract enforcement	√	√	Political	21	2.05	32	MC
34	Weak legal environment [i.e. in terms of effective litigation]	√		Contractual	22	2.00	33	MC
35	Lack of transparency in the discharge of managerial duties	√		Legal	21	1.81	34	NC
36	Bidding error during procurement e.g. poor evaluation of inflated/ aggressive bid	√		Administrative and managerial		1.77	35	NC
37	Opportunistic bidding [e.g. bid submission with the intent to increase prices at renegotiation]	√		Tendering and Bidding	22	1.77	35	NC

Key: VC= Very Critical, C = Critical, MC = Moderately Critical, C = Critical, NC = Not Critical.

Table 7.5 reveals that technical related factors and contractual factors mainly prompt renegotiation requests. The results show that the empirical study contradicts most of the submissions in the literature. The category of factors that can lead to renegotiation falls under regulatory, tendering and bidding, administrative and managerial factors. Some of the extremely critical factors under these categories include weak or inadequate regulatory framework, type of regulation and tariff, poor evaluation of aggressive bid and political instability, e.g. change in government or change in government priorities. Inaccurate estimations of traffic levels, misallocation of traffic risks and levels of effectiveness and efficiency of contract enforcement are very critical in the literature (See Section 3.6). Since the literature findings on Latin American countries, Spain and Portugal concession contracts, the differences in the results suggest that the factors leading to renegotiations of road concessions may differ from one country to another: it could also vary from one project to another.

The results of this study also indicate that some of the non-critical factors and the moderately critical factors identified in this empirical study are in the literature (See Table 7.5). These non-critical factors are amongst the prominent factors leading to the renegotiation of PPP road projects (See Table 3.4 of section 3.6 of this thesis). These imply that what drives renegotiation in some studies, which are on the experiences of other countries, differs from what leads to renegotiation in the context of the UK. There is the suggestion that there may be variations in the outcomes of renegotiation regarding VfM across countries.

There is an indication of the achievement of VfM by the respective respondents as shown in the results (See Table 6.8). Furthermore, bidding errors, which may lead to high bidding costs, has also been indicated to be a non-critical factor as shown in Table 7.5. Hence, the findings agree with the literature, which puts high transaction and bidding cost as the most significant barrier to public client participation in PFI projects (Carrillo et al., 2008). The reason for this submission is that the respondents place less emphasis on an aggressive bid and bidding error as a factor leading to the renegotiation of the road concessions. However, these factors in most instances are agreed to be the driving factors in the renegotiation experience that results to non-achievement of VfM (Menezes and Ryan, 2015a; Guasch et al., 2014; Bi and Wang, 2011; Athias and Nunez, 2008). Inadequate evaluation of aggressive bids and bidding error may be, therefore, a barrier to the accomplishment of VfM during the renegotiation of road concession projects. As a result, road concession projects should be well planned at the tendering and bidding stage to ensure that there is the achievement of VfM at the renegotiations during the implementation of the project.

Consequently, a cursory evaluation of the findings of the literature reveals that the factors identified as non-critical in this study are most likely to lead to renegotiations (Guasch et al., 2014; Bi and Wang, 2011; De Brux, 2010).

These suggest that the factors influencing renegotiation have a relationship with the renegotiation outcomes, regarding the achievement of VfM. Hence, there should be an avoidance of the non-critical factors by the renegotiation parties or primary stakeholders. Moreover, the renegotiating stakeholders should ensure that the reasons, which are propelling renegotiation, should not be the least critical factors identified in Table 7.5. The reason for this is to make sure that the renegotiation of the PPP contract fosters the achievement of VfM for the public sector as established in the case studies.

7.5 IMPACT OF THE RENEGOTIATION ON VALUE FOR MONEY CRITERIA

This section also explains the analysis of the answers given by the respondents regarding the impacts of the renegotiation on VfM criteria. Altogether, the renegotiation was found to affect fourteen of the VfM criteria, which are from the literature findings, with incidentally only nine out of the fourteen standards are traced to the case studies findings. The fourteen impacts were in the questionnaire (See Appendix 2), and the respondents were asked to identify the criteria level of their effects, based on a Likert scale as follows: 5– strongly agree, 4- agree, 3- Indifferent, 2- disagree and 1- strongly disagree. The findings reveal that cost is an important criterion used in assessing the impact of renegotiation regarding VfM, as construction cost, project finance cost and operation and maintenance cost in their respective order of significance are the most impacted VfM criteria out of all the fourteen assessed. Thus, it became evident that cost is the main criteria of VfM used to assess the renegotiation of PFI (DBFO) road projects.

Evidence from the empirical results, indicated in Table 7.6, highlight that the impact of renegotiation is mostly felt in their respective decreasing order of significance as follows: construction cost, project finance cost, operation and maintenance cost; whole lifecycle cost and cost of risk transferred as shown in Table 7.6. Subsection 4.6 of this thesis corroborates these findings. Also, the results of the interview conducted in CS1 by XY1 outlines, “Oh no. we are looking at cost reduction perspectives. Cost reduction is the primary target”. The statement of CS1, therefore, suggest that the various cost criteria are essential to the client or procuring authority during the measurement of the VfM achieved on PFI (DBFO) road projects. As such, one can conclude that the cost of road concessions is a crucial measure of VfM. Therefore, the price is the primary measure of VfM in PFI (DBFO) road projects as shown in Table 7.6.

The reason for this is that the cost criteria has the highest mean value in comparison to other criteria's for measuring VfM in concession projects, all of this supports the findings of the interview that indicates that it is an important consideration and target. There is also an indication that renegotiation of the road concession projects mostly affects the cost of construction and the project finance cost.

Profit for the concessionaire is the primary measure of VfM for the private sector stakeholder. Contrastingly, users' satisfaction is the primary concern of the client, which constitutes the primary objective and focus of PPP road projects. The results of the empirical study ascertain which of the objectives is greatly impacted by the renegotiation of DBFO road projects, revealing that user's satisfaction is impacted more by renegotiation than the profit of the concessionaire. The nature of this impact cannot be ascertained, regarding whether it is a positive or negative impact at this point. The following sub-section reveals the nature of the impact based on the outcome of the renegotiation. These results agree with the literature that PPP road project renegotiations have been found to affect the deliverables of cost and user's satisfaction through the increase of cost to the users and taxpayers (Guasch et al., 2014; Sarmento 2014).

The findings of this study further revealed that the renegotiation of the DBFO road concession could have an impact on the concession and construction duration. However, the experience of the UK PFI (DBFO) road projects renegotiation reveals that there is a more significant impact of the renegotiation on the length of the construction process, rather than the concession duration. However, the renegotiation also affects other VfM criteria. The results show that the private sector management expertise and skills are profoundly impacted by the renegotiation when compared with other criteria used in measuring VfM. The mean value of the impact of the renegotiation on the quality of service delivery is 2.95, which indicates a much lower effect on the VfM criteria. Also, the innovation of bidders in the use of output specification and concession duration is the least impacted VfM criteria with a mean value of 2.77 and 2.17 respectively, as indicated in Table 7.6.

Table 7.6: Impacts of the Renegotiation

S/N	Impacts	VfM Criteria	LR	CS	Freq.	Mean	Rank	Criticality Level
1	Construction cost	Cost	√	√	21	3.67	1	Critical
2	Project finance cost	Cost	√		21	3.62	2	Critical
3	Operation and Maintenance costs	Cost	√	√	21	3.48	3	Critical
4	User's satisfaction	Client Objective	√	√	22	3.45	4	Critical
5	Private sector management expertise and skills	Other	√		22	3.18	5	Critical
6	Whole Life Cycle Cost	Cost	√	√	22	3.14	6	Critical
7	Construction duration	Duration	√	√	22	3.14	6	Critical
8	Cost of risk transferred	Cost	√		22	3.09	8	Critical
9	Concessionaire's profit	SPV's Objective	√	√	22	2.73	9	Moderately Critical
10	Quality of Service Delivery	Quality	√	√	22	2.95	10	Moderately Critical
11	Competition that provides fair value of the project	Other	√		21	2.95	10	Moderately Critical
12	Performance based payment mechanism	Other	√	√	22	2.91	12	Moderately Critical
13	Innovation of bidders in the use of output specification	Other	√		22	2.77	13	Moderately Critical
14	Concession duration	Duration	√	√	22	2.17	14	Moderately Critical

An evaluation of the impacts of renegotiation on all the standards for measuring the VfM reveals that variations exist in the mean values of all the individual nodes of the impacts. The impacts of the renegotiation are felt in the costs, user's satisfaction and construction duration. All these represent the VfM standard, having the highest level of influence. The least impacted VfM criteria are concessionaire's profit and concession duration, which contrasts the literature that states that the renegotiation of PPP projects has been identified as leading to an increase in profit of the concessionaire as well as an extension of the concession duration (Fatokun et al., 2015). These suggest that the renegotiation of road concessions does not necessarily have to benefit the concessionaire to the detriment of the users and consequently disadvantage the procuring authority through the extension of concession duration, an increase in contract sum and a reduction in quality and performance of the concession.

The results of the analysis, as shown in Table 7.6, reveal that the renegotiation of PFI (DBFO) road projects has had a significant impact on the cost of construction, followed by user's satisfaction, project finance cost, operation and maintenance cost etc. This result is more striking in the sense that it reveals that renegotiation impacts cost more at the construction stage than any other variables of VfM. The reason for this impact may be due to the prominent factors leading to renegotiation at the technical phase of the PPP road projects delivery, which has implications for the cost of construction, usually in a negative form. These, therefore, reiterates the literature, which states that PPP renegotiations within the transport sector have not achieved value for money in the public client (Sarmento, 2014a; Hodge and Greve, 2009).

However, the succeeding section of this thesis substantiates these aspects of VfM achievement at the renegotiation stage by a thorough evaluation of the renegotiation outcomes.

There are no substantial changes to concessionaire's profit in comparison with the agreement before the renegotiation of PFI (DBFO) road projects. These surprising contrasts the literature findings, which state that most renegotiations in the transport sector including road projects have addressed the viability of the concession contracts to ensure a profitable return to the private sector (Acerete et al., 2009). Thus, the literature further contrasts with the belief that PPP road projects can be renegotiated and benefit both the public and private sector regarding VfM achievement for both parties. Based on this finding, it becomes imperative to evaluate and assess the measures required to achieve this different result, which is VfM to the public sector with non-excessive profits for the private partner at renegotiation.

7.6 OUTCOMES OF THE RENEGOTIATION

The analysis reveals the respective values of the renegotiation outcomes, which are by the criteria of VfM. The results address the research Objective 5 and evaluate the relationship that exists between renegotiation and VfM. The responses received indicate that there is excellent evidence of an increase in the criteria of VfM followed by an indication that the VfM standards remain unchanged. Though, there are fewer instances of decrease and reduction in the criteria adopted to measure the outcome of renegotiation as shown in Table 7.7.

Table 7.7: Outcome of Renegotiation

S/N	Outcome	LR	CS	Upward Review/ Increase (+ve)			Downward Review/ Decrease (-ve)			No action taken (Neutral)		
				Frequency	Percentage (%)	Rank	Frequency	Percentage (%)	Rank	Frequency	Percentage (%)	Rank
11	Outcome with respect to Construction Cost	√		8	32	9	3	12	5	11	44	3
12	Outcome with respect to Construction Duration	√		9	36	8	2	8	7	10	40	4
13	Outcome with respect to Operation and Maintenance Cost	√		12	48	4	3	12	5	7	28	7
14	Outcome with respect to Project Finance Cost		√	11	44	6	1	4	8	10	40	4
15	Outcome with respect to Cost of Risk Transferred		√	10	40	7	2	8	7	9	36	6
16	Outcome with respect to Users Satisfaction	√	√	16	64	1	0	0	9	6	24	9
17	Profitability of the Road Concession to the SPV	√	√	6	24	11	12	48	1	3	12	10
19	Outcome with respect to quality and performance	√	√	16	64	1	5	20	3	1	4	11
20	Outcome with respect to Whole Life Cost	√	√	8	32	9	7	28	2	5	20	
21	Outcome with respect to Concession Duration	√	√	5	20	12	2	8	7	15	60	1
24	Outcome with respect to Performance Based Payment Mechanism	√	√	12	48	4	4	16	4	14	56	2
25	Outcome with respect to Private Sector Management Expertise and Skills	√	√	14	56	3	1	4	8	7	28	7
	Total			**127**			**42**			**98**		

Key: LR – Literature Review, CS – Case Studies

Though, 14 criteria are identified as adopted in the evaluation of VfM achieved. However, eight out of the fourteen VfM criteria are been influenced by PFI (DBFO) road projects: cost, time, quality, whole life cost, duration, SPV profit and user's satisfaction (See Table 7.7). Also, an evaluation of the data collected reveals that 64% of the respondents indicated that users are satisfied, while only 6% agree with the neutrality of the user's satisfaction concerning the output of the renegotiated projects, as shown in Table 7.7. The quality and performance of the standards of output also increased by 64%, which indicates that the renegotiation has no real impact on the quality and performance of the DBFO road projects. 20% of the respondents show a decrease in the quality and performance, while another 4% indicated no variations in the quality and performance of the road outputs.

The percentage of respondents that claimed non-extension of concession duration is 60%, which is higher than the percentages of respondents who indicated an extension and reduction of the concession duration of PFI (DBFO) road projects. These suggest that there is a low degree of changes in concession duration in PFI (DBFO) road projects. It also indicates that 44% of the PFI (DBFO) road projects are completed to cost and budget as detailed in the contract agreement. The completion of a project to the terms of the contract can create satisfaction for the procuring client and the users, with the pleasure of the users is by 88% of the respondents. 40% of the respondents attested to the upward review of the cost of risk associated with the project. However, 36% of respondents claim there is a neutral cost of risk included in the contract at inception, while 8% of respondents agree that there is a downward review of the cost of risk, totalling 44%. These imply that the outcome of the renegotiation regarding the value of risk is not adverse.

The cost of project finance shows a 44% increase in funding, with 40% of respondents indicating that no action was taken regarding project finance as shown in Table 7.7. Thus, the cost of project finance remains unchanged through the concession period to date; while only 4% of the respondents indicate a downward review and decrease in project finance costs. Moreover, the cost of construction and the whole life cost show no significant variance at renegotiation. 32% of respondents agree to the review of the cost of construction, while 44% of the respondents indicate that there is no review action required due to the cost neutrality condition included in the contract. 12% of responses show a decrease in the cost of construction at the renegotiation stage. Overall, there is no indication that the value of the construction projects increases or are reviewed upwardly. These findings contrast the supporting literature, which identifies an increase in construction cost at the renegotiation stage of PPP road projects (Acerete et al. 2010).

Table 7.7 further indicates that 32% of the respondents indicate that there is an increase in the whole life cost of the concession. Though all the projects are still in the operation stages and the overall lifetime cost of the projects cannot be estimated to date. Therefore, the estimation of the

whole life cost of the project should be taken as the whole cost of the road projects to date. However, the assumption is that the respondents provided information based on the cycle of the project to date rather than the whole life cycle of the project since no road concession project in the UK have completed their lifecycle. There are no adverse impacts on the VfM criteria concerning O &M cost, whole life cycle cost, the profitability of the road concession to the SPV and concession duration, all of which are found to be impacted by renegotiation, as discussed in subsection 7.6.2 of this chapter. Renegotiation can lead to neutral profit for the SPV of up to 20%, and there is evidence of an increase in profit to the tune of 24%. However, there is an indication that 48% of the respondents agree that the profit of the SPV was reviewed downward, as shown in Table 7.7. These findings indicate that the concessionaire profit review is in favour of the public up to 68%, while 8% of the respondents did not show any response.

There is a suggestion that the renegotiation of the PFI (DBFO) road projects have not increased the profitability of the concession in favour of the concessionaire, but instead, there has been an increase in the satisfaction derived from the users (Acerete et al., 2009). The findings of this empirical study contrast the literature position, which identifies that over 54.7% of the renegotiated transport concession contracts in Latin America benefited the concessionaires to the detriment of the public sector procuring entity, and especially the users (Guasch, 2004). This affirms that the outcome of renegotiation of PFI (DBFO) road projects can be satisfactory to the users and can achieve VfM for the public sector procuring agency. Hence, the outcomes of the renegotiation regarding the main VfM criteria are shown in Table 7.7.

The ranks of the respective items in Table 7.7 indicate that the renegotiation of PFI (DBFO) road projects in the UK has succeeded in ensuring the achievement of users' satisfaction and improving the quality and performance of the concession outputs and products amongst other things. The profitability of the concession contract to the SPV has not been increased to the detriment of the public sector or the users. Indeed, there is the evidence of no changes in the profit of the SPV, as well as the downward review of the concessionaire's profit in some instances. Indeed, more respondents indicated that the renegotiation ensures that the SPV's profit is on a cost-neutral basis. Also, the results of the outcomes regarding the main VfM criteria indicated in Table 7.7, shows that there is almost a 50:50 ratio regarding an increase and neutrality of the outcomes of the renegotiation. These are the criteria of construction cost, duration, O&M costs, project finance cost, whole life cost and the cost of risk transfer.

Furthermore, these findings indicate that there is evidence of the achievement of VfM in the public sector, mainly the users. The accomplishment of VfM is because the outcomes suggest that there is a favourable renegotiation, based on the percentages obtained on the primary results regarding VfM criteria identified as the basis of measuring the level of success of infrastructure

projects in PPP road projects. There is a suggestion that renegotiation of the PFI (DBFO) road projects has not increased the profitability of the concession in favour of the concessionaire, but instead, there has been an increase in the satisfaction derived by the users (Acerete et al., 2009). The finding of the empirical study contrasts the literature, which identifies that over 54.7% of the renegotiated transport concession contracts in Latin America benefited the concessionaires to the detriment of the public sector procuring entity and especially the users (Guasch et al., 2004). The finding affirms that the outcome of renegotiation of PFI (DBFO) road projects can be satisfactory to the users and achieve value for money for the public sector procuring agency.

Evidence in the literature indicates that renegotiation of PPP road projects benefited the concessionaire to the detriment of the public-sector clients and the users (Sarmento, 2014a, Guasch et al., 2008a, Guasch et al., 2004). The results suggest that there has been the achievement of VfM for users, members of the public and the public clients or governments. Therefore, the outcomes of renegotiation of PPP road projects do not necessarily have to lead to non-achievement of VfM for the main contracting parties, i.e. the private or public sector or any of the stakeholders.

7.6.1 Remedial Actions

The findings also indicate that remedial actions could take place as outcomes of the renegotiation. Although the literature suggests the items listed in Table 7.8 as possible outcomes of the renegotiation process of PPP road projects. The findings of the case studies reveal that specific remedial actions can be taken to address the renegotiation results. Thus, the outcomes of the renegotiation may necessitate corrective actions from the primary stakeholders of the road concession projects. The outcomes of the renegotiation of the road concessions give credence to the results as indicated in Table 7.8.

Table 7.8: Other Outcomes of Renegotiation

S/N	Other Outcomes	LR	CS	Frequency	Percentage (%)	Rank
1	**Outcome with respect to Government Payment to the SPV**					
i.	Government direct financial compensation to the SPV (e.g. direct financial reimbursement)	√	√	10	40	1
ii.	Redefining of the investment plans by the SPV	√		7	28	2
iii.	No adjustments in the annual fee paid by the operator to the government	√		4	16	3
iv.	Government subsidies to the SPV	√		3	12	4
v.	Downward adjustments on the annual fee paid by the operator to the government	√		3	12	4
vi.	Bonus points issued to the SPV as a penalty for non-performance	√	√	1	4	6
vii	Upward adjustments on the annual fee paid by the operator to the government	√		1	4	6
viii.	Financial rescue of the project by government	√		0	0	7
2	**Outcome with respect to Innovation using Output Specification**					
i.	Enhances innovation of bidders because of use of output specification	√		12	48	1
ii.	Use of output specification does not foster innovation or makes any significant difference	√		6	24	2
iii.	No evidence of the adoption of output specification and consequently no record of innovation.	√		3	12	3
iv.	Reduction of the concession duration of the road concession	√	√	1	4	4
3	**Outcome with respect to Fair Value of the Project Due to Competition**					
i.	Competition among bidders affords the attainment of a fair value for the public sector on the project	√		15	60	1
ii.	No competition on the project at renegotiation or variation results in the achievement of a fair value for the public sector			3	12	2
iii.	Competition among bidders does not result into a fair value for the public sector on the project	√		2	8	3
iv.	No competition on the project at renegotiation or variation results in no evidence of the achievement of a fair value for the public sector on the project			2	8	3
4	**Others**					
i.	Revised service delivery modalities	√	√	16	64	1
ii.	Raises questions about the credibility of the renegotiation process to deliver value for money for the public-sector modalities.	√		5	20	2

There are other outcomes relating to the renegotiation of DBFO road projects regarding the VfM criteria, as shown in Table 7.8. These results indicate the outcomes of the renegotiation regarding the VfM criteria identified in the literature (Public PPP Malaysia, 2009). This section discusses Table 7.8 by presenting the percentage of the renegotiation outcomes based on other VfM criteria of the road concessions. The levels of the respective outcomes of the renegotiation regarding the rankings are shown in Table 7.8.

64% of the respondents indicate revised delivery modalities as the outcome of renegotiation in DBFO road project renegotiation outcomes, which result in the highest-ranking criteria of VfM in this group. 60% of the respondents indicate that competition amongst bidders affords the attainment of fair value for the public sector. The third most highly ranked VfM criteria attracted 56% agreement from the respondents, who indicated that there is no performance-based payment mechanism in place on the project and as a result prevents the evaluation of value for money achieved on the project. There is, therefore, a suggestion that a performance-based payment mechanism can facilitate the assessment of VfM made on the project. The 48% of responses received from the respondents substantiates this suggestion by identifying that payment is made on the DBFO road projects based on the performance of the output, which ensures the achievement of value for money. Also, 48% of the respondents identify that there is an enhancement of the innovation of bidders because of the use of output specification on the DBFO road projects. These indicate the critical outcomes of the PFI (DBFO) road projects regarding the VfM criteria.

Government payment to the SPV in the form of direct financial expenditure is ranked 6th with a 40% response rate, which indicates that there is a low percentage of responses recorded against the government payments, i.e. in the form of direct financial expense. This finding suggests that the disbursement of the funds may be required to facilitate the cost of changes at the technical stage of implementation, as well as other additional works necessitating renegotiation. However, the frequency of governments disbursement and payment to cushion the effect of renegotiation is not high.

Table 7.8 also highlights that on no occasion does the public-sector client or government, financially rescue any PFI (DBFO) road projects from failure. Only 4% of questionnaire respondents identify evidence of upward adjustments on the annual fee paid by the operator to the government, as well as bonus points issued to the SPV. There is no evidence of improvements in the management expertise of the private sector, including a reduction in the concession duration of the road projects.

Moreover, 4% of the respondents show evidence of improvement in the management expertise and skills of the private sector, which are all considered to be of less importance and significance, as shown in Table 7.8.

7.7 MEASURES TO ENSURE VFM AT RENEGOTIATION

Section F of the questionnaire elicits information regarding the measures, which may be used to foster the achievement of VfM in the PFI (DBFO) road projects renegotiation as follows (See Appendix 3). The reliability and ANOVA test statistics, based upon the responses analysed, reveal the values that justify the reliability of the data collected. A discussion of the findings regarding the measures to ensure the achievement of VfM at renegotiation is in detail in this section.

The supporting literature has established measures, which can serve as solutions to the problem of VfM in the renegotiation of PPP infrastructure projects (Guasch et al., 2014). Indeed, the preliminary pilot interviews and the final interviews have also succeeded in identifying measures, which are peculiar to the case studies, some of which are distinct from the literature suggestions. These measures are considered capable of assisting the achievement of VfM during the renegotiation of road concessions. The measures are listed in their respective categories, as indicated in Table 7.9. Also, the mean values, the ranks of the individual nodes and the level of criticalness of each of the nodes obtained, based on the analysis of the forty-two measures, are coherently tabulated, evident from as Table 7.9. The measures are there mainly to address the problem of VfM achievement identified in PPP road project renegotiations.

There is a need to ensure that specific measures are put in place at the design and planning stage of PPP road project implementation to ensure the achievement of VfM for the public sector. The prominent measures, agreed by the respondents at the design and planning stage, are there to develop a clear, concise and adequately written contract, e.g. specification of standards of materials, components and workmanship. The contract developed must contain a provision that states that the renegotiation of PPP road projects must be on VfM. There must also be a proper stipulation of the criteria and modalities for the achievement of VfM at the design and planning stage, including an accurate estimation of project requirements. Another critical measure suggested by the respondents at the design and planning stage is the definition of the performance indicators, which will guide the delivery of the project at the technical phase of project implementation. The client develops performance standards for the concessionaire during the contract inception as a requirement for initiating renegotiation request payment.

All the design and planning measures have mean values of no less than 3.00, which indicates that the measures for ensuring VfM renegotiation at the design and planning stage are all critical to the achievement of VfM for the public sector and other stakeholders in general. Adequate measures are also required at the tendering stage of PFI (DBFO) road project renegotiations to ensure the achievement of VfM. The tendering and bidding measures, which have the highest mean values of 3.73, are the requirement to cancel PPP road concessions, which are mainly characterised by aggressive and opportunistic bidding. The findings also indicate that there is a clear need to define adequate and strict criteria for contract awards and to discourage opportunistic and aggressive bids.

There is a need to ensure that proper steps and measures during the technical implementation of the project to achieve stakeholders VfM objectives. A mean value of 3.86 indicates that the client, due to non-performance of the SPV's, should intensify teamwork throughout the management of the project; while the lowest ranking measure can cause an outright contract takeover. The respondents also consider the establishment of a clear jurisdiction at a high level over the decision to renegotiate the contract as a critical measure adopted to ensure VfM. The least important measure is the need to provide a statement in the PPP regulation, which establishes the inalterability of the contract risk matrix. The appropriate constitution of a qualified and knowledgeable panel of experts to manage aggressive bids, renegotiation request and conflicts ranked highest in the administrative and managerial category, with a mean score of 3.59, followed by the need to ensure transparency of the renegotiation process. The least critical regulatory factor is the need for the client or government, via an instruction to the concessionaire, to establish less or non-disposal to the renegotiation of the PFI (DBFO) road project.

Regarding risk allocation, there is the need to ensure that renegotiation of the contract does not alter the VfM described or the risk allocation, which is the principal risk measure identified by the respondents. A mean value of 3.55 indicates another critical measure, which suggests the establishment of a clause in the contract agreement, which states that the modification of the contract must ensure a zero-net present value (NPV) and must preserve VfM defined at the contract formation. Other measures are moderately critical, and these are found in the regulatory, administrative and managerial as well as economic categories, with mean values of 2.75, 2.82 and 2.91, as indicated in Table 7.9.

Table 7.9: Details of the Measures to Ensure VfM at Renegotiation

S/N	Measures	LR	CS	Category	Freq.	Mean	Rank	Criticality Index
1	Develop a clear and concise written contract [e.g. specification of standards etc.]	√		Design and Planning	22	4.27	1	VC
2	Define and establish a set of criteria and modalities for the identification, measurement and recording of the VfM achieved at strategic renegotiation points during the PFI road projects renegotiation	√	√	Design and Planning	22	4.23	2	VC
3	Ensure accurate estimation of requirements [e.g. cost of materials, traffic level, finance cost, cost of risks and capital costs, etc.]	√		Design and Planning	22	4.18	2	VC
4	Clearly state in the contract that renegotiation must be based on VfM	√		Design and Planning	22	4.18	4	VC
5	Define performance indicators at the contract formation stage to ensure that more focus is placed on the delivery of the project with reference to these indicators	√	√	Design and Planning	22	4.09	5	VC
6	Establish performance standards for SPVs at contract inception as a requirement for initiating renegotiation request payment	√	√	Design and Planning	22	4.00	6	VC
7	Establish a clear platform showing the process and procedure for renegotiation at the inception of the contract	√		Design and Planning	22	3.86	7	C
8	Fix penalty points for non-performance with applicable limits to SPVs before contract takeover by the client	√		Design and Planning	22	3.86	7	C
9	Teamwork should be intensified throughout the management of the project	√	√	Technical	22	3.86	7	C
10	Clarify key contractual clauses and key biding documents at contract inception	√		Design and Planning	22	3.82	10	C
11	Cancel PPP road concessions mainly characterised by aggressive and opportunistic bids.	√		Tendering and Bidding	22	3.77	11	C
12	Develop an effective parameter or trust process during technical implementation that allows both parties to understand the impact of any renegotiation on the project objectives.	√	√	Technical	22	3.77	11	C
13	Stipulate the renegotiation approach, criteria and process prior to contract formation	√		Design and Planning	22	3.77	11	C
14	Ensure a proactive, collaborative and analytical approach in the making and management of the contract to foster friendliness between and among the partners	√	√	Technical	21	3.76	14	C
15	Establish in the contract the right to evaluate and reject aggressive and reckless bids including submission of financial models for those bids or additional guarantees/financial bonds	√	√	Tendering and Bidding	22	3.73	15	C
16	Define adequate and strict criteria for contract award to discourage opportunistic and aggressive bidding	√		Tendering and Bidding	22	3.73	15	C
17	Establish contract review processes and requirements with the aim of affecting defined or allowable changes to the contract	√	√	Design and Planning	22	3.73	15	C
18	Include in the contract agreement a contract award criterion which increase renegotiation request costs to the SPV's and make exit from the contract expensive	√		Design and Planning	22	3.68	18	C
19	Establish outright contract takeover by the client due to non-performance of the SPV's	√	√	Design and Planning	22	3.64	19	C
20	Constitution of qualified and knowledgeable panel of expert to manage aggressive bids, renegotiation request and conflicts	√	√	Administrative and Managerial	22	3.59	20	C

Table 7.9: Details of the Measures to Ensure VfM at Renegotiation (Contd.)

S/N	Measures	LR	CS	Category	Freq.	Mean	Rank	Criticality Index
21	Include a clause in the contract agreement, which stipulates modalities for financial equilibrium	√		Design and Planning	22	3.57	21	C
22	Establish that the modification of the contract must ensure zero net present value (NPV) and must preserve VfM defined at contract formation.	√	√	Risk	22	3.55	22	C
23	Establish in the contract that the modification of the contract, because of renegotiation, must not alter the VfM described or the risk allocation	√		Risk	22	3.55	22	C
24	Establish the renegotiation reasons during the project implementation, to assist in ascertaining the impact of the factors or reasons on VfM	√	√	Technical	22	3.55	22	C
25	Establish modalities for the submission of financial models required for evaluating bids or additional guarantees/financial bonds	√		Tendering and Bidding	22	3.50	25	C
26	Include hand-back requirements by the public sector [i.e. salvage value/depreciation level allowed at delivery or handover]	√	√	Design and Planning	22	3.50	25	C
27	Establish clear jurisdiction at high level over decision to renegotiate the contract	√		Regulatory	22	3.50	25	C
28	Control aggressive bids by inclusion of larger performance bonds in the contract	√		Tendering and Bidding	22	3.45	28	C
29	Include project plan reviews [e.g. every 3 years to monitor the performance of the project and particularly of VfM]	√	√	Design and Planning	22	3.45	28	C
30	Ensure transparency of the renegotiation process during implementation of road concessions	√	√	Administrative & Managerial	22	3.41	30	C
31	Establish guidelines for levels of compensation applicable at strategic renegotiation points during project implementation	√		Design and Planning	22	3.41	30	C
32	Request a mandatory bidding process for additional works or infrastructures including interest rate for PPP financing	√		Tendering and Bidding	22	3.36	32	C
33	Prepare for contingent financing over time and throughout the implementation process because of viability gap funding	√		Technical	22	3.27	33	C
34	Outright contract takeover by the client due to non-performance of the SPV's	√		Technical	22	3.27	33	C
35	Ensure that the contract risk matrix includes detailed risks identification and allocation	√		Risk	21	3.24	35	C
36	Establish greater role of the PPP unit and regulatory agency	√		Design and Planning	22	3.00	36	C
37	Include a freeze period for renegotiations [e.g. 2-3 years after contract award through the placement of embargo on materials & work standards, etc.]	√	√	Design and Planning	22	3.00	36	C
38	Impose on the SPV's appropriate level of performance bonds [e.g. between 10-25% of the total PFI road project investment]	√	√	Risk	22	3.00	36	C
39	Implement a transparent framework through increase of political costs to accept renegotiation demands	√		Political	22	2.95	39	MC

Table 7.9: Details of the Measures to Ensure VfM at Renegotiation (Contd.)

S/N	Measures	LR	CS	Category	Freq	Mean	Rank	Criticality Index
40	Provide allowance for extension of concession contract in austere and adverse economic situations	√	√	Economic	22	2.91	40	MC
41	The client should establish a reputation of less or non-disposal to renegotiation at inception	√		Administrative& Managerial	22	2.82	41	MC
42	Provide a statement in the PPP regulation establishing the inalterability of the contract risk matrix	√		Regulatory	20	2.75	42	MC

Key: See List of abbreviations

The findings in Table 7.9 indicate that there is a need to take effective and efficient measures in the design and planning stage to ensure the achievement of VfM at renegotiation. The results of Table 7.9 confirm that most of the respondents identify that the measures are taken to address the renegotiations to ensure the achievement of VfM mostly occur at the design and planning stage. As a result, there is the suggestion that the measures are necessary at the inception of the contract to ensure the renegotiations, which characterise the intra-deal renegotiations, i.e. renegotiations that occur during the implementation of the road concessions (Salacuse, 2000).

The findings also suggest that critical measures, which characterise the responses, fall in the tendering and bidding category. These imply that renegotiation measures are necessary at the tendering stage of PPP road concessions to ensure VfM achievement. This submission agrees with the literature, as most of the renegotiations leading to non-achievement of VfM have a poor evaluation of opportunistic and aggressive bids, as they are the leading factors responsible for such renegotiations (Menezes and Ryan, 2015b; Bi and Wang, 2011; Chan and Levitt, 2009). Thus, there is a need to adopt appropriate measures at the tendering and bidding stage to address the renegotiation problem of opportunistic and aggressive bids, which are considered the bane of road concession renegotiations.

The results from Table 7.9 reveal that the first seven factors identified by the respondents as measures adopted in realising the VfM objectives of the projects, fall under the design and planning categories and are ranked according to their respective individual factors. Most unprofitable renegotiations for the public sector would not have occurred if the critical design and planning measures identified in Table 7.9 had been adopted to address the impact of the technical and additional works factors. On the other hand, other measures with lower levels of importance, as shown in Table 7.9, fall under the economic, political, regulatory, administrative and managerial respectively.

7.8 APPROPRIATENESS OF THE RELIABILITY AND ANOVA TEST STATISTICS

This section presents the statistical test on the respective sections of the questionnaire including the appropriateness of their use for analysis of the data collected from the sampled respondents. Though, there are limitations to having small and uneven sample sizes in the analysis of data. However, there is usually the question regarding the guideline to ascertain the minimum sample that is acceptable for a valid result.

Numerous research studies in the social sciences have used small sample like the one used in this study due to difficulty in reaching the population, legal issues involved in the collection of data within the study population and sensitivity of the sphere of the research, which reduces the numbers of responses. Inequality of sample sizes or small sample sizes should not be an issue in achieving a valid result as observed in the previous quantitative study (Brockwell and Gordon, 2001). However, a statistical appraisal which attempts to check the data distributions for normality has been proposed as a solution when ascertaining the possibility of having a valid analysis result in a quantitative study.

The more symmetric the distribution of the response values are, the more the possibility of acceptance of the smaller sample sizes. Though, the ANOVA as used in this study could be sensitive to statistical outliers. In a situation where there usually is distribution, and each group are independent, a 1-way ANOVA have been identified to be entirely suitable for analysis. The use of ANOVA has been recommended to be followed by statistical testing to compare each group against the other or the data within the group. Hence, the reason for the reliability testing within the group, which attempt to evaluate in comparison the "corrected item of the total correlation coefficients" in almost all the individual factors with the standard benchmark of 0.3. All the different elements are expected to be greater than (>) 0.3. Thus, the Cronbach Alpha coefficient (If the item is deleted) was, therefore, evaluated in comparison with overall/ standard coefficient of Alpha as shown in Table 7.10 to ascertain the reliability and validity of responses from the small sample of the study. The result obtained using these tools for reliability testing indicates that there is no non-normality, which can necessitate the consideration of robust statistical solutions than the one used for analysis in the study. Hence, the conclusion is that the tools used for the statistical test of the study sample are appropriate to achieve a valid result.

7.8.1 Reliability and ANOVA Test of the Factors Leading to Renegotiation

The responses to the factors leading to the renegotiation have been tested for reliability and validity within the sample and have been collated accordingly (See Table 7.10).

The *"corrected item of the total correlation coefficients"* in almost all the individual factors are greater than (>) 0.3. Hence, the value is significant for those individual nodes of factors leading to the renegotiation of PFI (DBFO) road projects. Similarly, the standardised, or overall Cronbach's coefficient of alpha, is equal to the "Cronbach's alpha if the item is deleted"; although this value is expected to be greater than the "Cronbach's alpha if the item is deleted" of all the individual items in most instances. Hence, the data collected in this section can be said to be reliable and valid. Therefore, 0.959 becomes the Alpha value when each of the factor items is deleted.

Moreover, ANOVA (F-test) results proved significant, as well as all the individual values found to be < 0.05. Therefore, the results enumerated in (i) and (ii) above, suggest that there exist internal consistencies within the values of the data collected from the survey. Hence, the results obtained reveal that they are reliable, as the value of standardised Cronbach's alpha coefficient of the factors considered leading to the renegotiation of PFI (DBFO) road projects is 0.959. However, the Cronbach's Alpha, if the item is deleted due to some of the factors, is 0.963, 0.961, 0.969 and 0.962 respectively.

These values are more significant than the overall Cronbach's Alpha coefficient. However, if each of the renegotiation leading factor item is deleted, then there will be an improvement in the overall reliability of the system, and the value will be 0.959, as stated in Table 7.10. The results of the ANOVA test conducted on the data collected to establish the difference in the mean value of the samples revealed that there is a substantial agreement between the responses received and that there is a common trait shared to a significant level (sig. ≤0.05). The reliability of all the data collected is ascertained and respected. Based on the results, which show a substantial agreement between the responses provided by the questionnaire respondents, as indicated in Table 7.10.

Table 7.10: Reliability Test of Factors Leading to Renegotiation

S/N	Factors	Category	Corrected Item-Total Correlation	Cronbach Alpha		ANOVA
				If Item is Deleted	Overall Coefficient	
1	Change in the standards of works during the technical development	Technical	.640	0.963		
2	Specification changes [e.g. change in the standard of technical skills, change in the type of technology]	Technical	.026	0.961		
3	Change in the scope of works	Technical	.315	0.963		
4	Additional works during construction [e.g. requirement for extension or widening of the road network]	Contractual	.554	0.959		
5	Additional works during operation & maintenance [e.g. removal and replacement of assets]	Contractual	.403	0.963		
6	Changes in infrastructure design, layout and programme during project execution	Technical	.596	0.969		
7	Environmental impacts	Environmental	.701	0.958		
8	Managerial initiatives to keep up with current contract standards	Administrative and managerial	.112	0.961		
9	Changes in pricing and service to be provided as stated in the tender	Tendering and Bidding	.303	0.960		
10	Social acceptability of user charges by the members of the public	Social	.771	0.951		
11	Inaccurate or defective project specifications	Design	.857	0.957		
12	Archaeological constraints	Environmental	.701	0.958		
13	Changes to general price level and transaction costs due to inflation	Economic	.700	0.958		
14	Opposition to continuation of the project by the members of the public	Social	.909	0.958		
15	Inaccurate estimation of the traffic level forecasts or levels	Contractual	.913	0.957		
16	Poorly written contract [e.g. ambiguity of terms and contract details]	Contractual	.021	0.962		
17	Time overruns for bidding and contract negotiation	Contractual	.888	0.957		
18	Political instability occasioned by changes in government or changes in government priorities.	Political	.725	0.958		
19	Corporate social responsibility considerations	Social	.621	0.958		
20	Erroneous change in the basis for tender	Tendering and Bidding	.871	0.957		
21	In-accurate estimation of capital cost	Design	.877	0.957		
22	Political instability evidenced in contract award shortly before or after elections	Political	.770	0.957		
23	Changes in economic policy by government [e.g. high or incremental changes to corporate tax and levies]	Economic	.725	0.958	0.959	0.000
24	Mismatch between the public and private partners objective [e.g. in terms of profit sharing]	Others	.743	0.958		

Table 7.10: Reliability Test of Factors Leading to Renegotiation (Contd.)

25	Inadequate contract management expertise or knowledge	Contractual	.850	0.957		
26	Management incompetence [e.g. administrative delays during project execution]	Administrative and Managerial	.626	0.958		
27	The need to respect and adopt the overriding interest of major political constituency in the parliament	Political	.775	0.957		
28	Defective contract awards criteria or incorrect contractual assumptions	Contractual	.746	0.958		
29	Ineffective governance and regulation of the renegotiation process necessitating specific statutory changes to the contract	Regulatory/ Legal	.890	0.957		
30	Inadequate feasibility studies and another ex-ante pre-tender analysis	Tendering and Bidding	.836	0.957		
31	Corruption at governance level e.g. awarding contract because of the nationality or affiliation of the concessionaire.	Political	.761	0.957		
32	Corruption at governance level evidenced in misappropriation of funds	Political	.704	0.958		
33	Ineffectiveness and inefficiency of contract enforcement	Contractual	.653	0.958		
34	Weak legal environment [i.e. in terms of effective litigation]	Legal	.843	0.957		
35	Lack of transparency in the discharge of managerial duties	Administrative and managerial	.633	0.958		
36	Bidding error during procurement e.g. poor evaluation of inflated/ aggressive bid	Tendering and Bidding	.614	0.958		
37	Opportunistic bidding [e.g. bid submission with the intent to increase prices at renegotiation]	Tendering and Bidding	.759	0.958		

7.8.2 Reliability and ANOVA Test of the Renegotiation Impacts on VfM Criteria

This section also explains the analysis of the answers given by the respondents regarding the impacts of the renegotiation on VfM criteria. As previously described, the analysis of the responses received revealed the reliability and ANOVA test statistics, as discussed herein.

The impact of renegotiation on the classified VfM criteria has been discussed in-depth. Table 7.11 indicates the reliability tests of the samples obtained regarding the impact of the renegotiation on VfM criteria. The findings reveal the characteristics of the impacts based upon the mean values of the Cronbach Alpha and the ANOVA in relation to all the individual nodes of all the items. The *"corrected item of the total correlation coefficients"* in most of the individual factors > is greater than 0.3, as in the case of Table 7.11. As previously described, the value is significant to those individual nodes and the impact it has on the renegotiation of VfM criteria. Also, the *"Standardised or overall Cronbach's coefficient of alpha"* is equal to the *"Cronbach's alpha if the item is deleted."* This value should be greater than > the *"Cronbach's alpha if the item is deleted"*, concerning all the individual items in most instances. The data collected in this section can be said to be reliable and valid. 0.964 can be taken to be the Alpha value when each of the factor items is deleted.

Moreover, the ANOVA (F-test) results prove significant, as the individual value is found to be ≤ 0.05. Hence, the results obtained reveal that they are reliable, as the value of the standardised Cronbach's alpha coefficient of the impact of the renegotiation on VfM criteria is 0.964. Although, the Cronbach's Alpha, if the item is deleted for serial number 3 and 4, has an impact of 0.965 and 0.966 respectively, which is higher than the standardised Cronbach's Alpha coefficient of 0.964. However, if each of the renegotiation impacts of the VfM criteria is deleted, then there will be an improvement in the overall reliability of the system, and the value will be 0.964, as indicated in Table 7.11. The results of the ANOVA test conducted on the data collected to establish the difference in the mean value of the samples, further confirms the existence of a substantial agreement between the responses received. It also establishes that there is a common trait shared at a significance level of (sig. ≤0.001), as shown in Table 7.11.

Table 7.11: Reliability Test of the Impacts of Renegotiation on VfM Criteria

S/N	Impacts	Category	Corrected Item-Total Correlation	Cronbach Alpha		ANOVA
				If Item is Deleted	Standardised Coefficient	
1	Construction cost	Cost	0.851	0.960		0.001
2	Project finance cost	Cost	0.894	0.959		
3	Operation and Maintenance costs	Cost	0.612	0.965		
4	Users satisfaction	Client Objective	0.561	0.966		
5	Private sector management expertise	Others	0.735	0.963		
6	Whole Life Cycle Cost	Cost	0.769	0.962		
7	Construction duration	Duration	0.865	0.959		
8	Cost of risk transferred	Cost	0.761	0.962	0.964	
9	Quality of Service Delivery	Quality	0.914	0.959		
10	Competition that provides fair value of the project	Others	0.823	0.961		
11	Performance based payment mechanism	Others	0.800	0.961		
12	Innovation of bidders in the use of output specification	Others	0.862	0.960		
13	Concession duration	Duration	0.905	0.959		
14	Concessionaire's profit	SPV's Objective	0.790	0.962		

7.8.3 Reliability and ANOVA Test of the VfM Measures at Renegotiation

The individual measures in their respective categories, as identified by the respondents, give credence to the submissions of the literature that there are measures for ensuring the achievement of VfM within the purview of PFI (DBFO) road project renegotiations. Rankings identify the levels of the respective measures regarding the degree of their criticalness in Table 7.12.

The *"corrected item of the total correlation coefficients"* in all the individual measures is greater than (>) 0.3 in most cases, as shown in Table 7.12. The *"corrected item of the total correlation coefficients"* of most of the individual factors > is higher than 0.3. However, some are not greater than 0.3 and raise minor questions about the reliability of the data on those affected nodes. However, the value can be regarded as significant in most of the individual nodes of the renegotiation measures required to ensure the achievement of VfM.

The standardised Cronbach Alpha coefficient is 0.941, which is expected to be >greater than the Cronbach Alpha required to make the values significant in those individual nodes. The measures, in all the different nodes, show consistency with few exceptions, which raises questions about the reliability of the nodes of those measures. Therefore, the *"Standardised Cronbach's Coefficient of Alpha"* is equal to the *"Cronbach's alpha if the item is deleted".* Though this value is expected to be greater than the (i.e., >) the *"Cronbach's alpha if the item is deleted"* of all the individual items; the data collected here is considered reliable.

Therefore, to make it reliable, 0.941 becomes the Alpha value when each of the factor items is deleted. Also, the ANOVA (F-test) result proved significant, as the individual value is found to be < 0.05. Hence, there is consistency in the system. The reliability and validity analysis are as shown in Table 7.12. Most of the measures required in ensuring the achievement of VfM at the renegotiation stage fall under the design and planning categories. Indeed, the first seven factors identified by the respondents, as the measures adopted in realising the VfM objectives of the projects fall under the design and planning categories. There is, therefore, the suggestion that most of the unprofitable renegotiations recorded in the literature would not have occurred if all the identified measures were adopted. The measures with the lowest level of importance fall under the economic, political, regulatory, administrative and managerial respectively, as indicated in Table 7.12.

Table 7.12: Reliability Test on Measures to ensure VfM at Renegotiation

S/N	Measures	Category	Corrected Item-Total Correlation	Cronbach Alpha		ANOVA
				If Item is Deleted	Overall Coefficient	
1	Develop a clear, concise and properly written contract [e.g. specification of standards etc.]	Design & Planning	.459	1	0.941	0.001
2	Define and establish a set of criteria and modalities for the identification, measurement and recording of the VfM achieved at strategic renegotiation points during the PFI road projects renegotiation	Design & Planning	.120	2		
3	Ensure accurate estimation of requirements [e.g. materials cost, traffic level, finance cost, cost of risks and capital costs, etc.]	Design & Planning	.807	3		
4	Clearly state in the contract that renegotiation must be based on VfM	Design & Planning	.437	4		
5	Define performance indicators at the contract formation stage to ensure that more focus is placed on the delivery of the project with reference to these indicators	Design & Planning	.434	5		
6	Establish performance standards for SPVs at contract inception as a requirement for initiating renegotiation request payment	Design & Planning	.218	6		
7	Establish a clear platform showing the process and procedure for renegotiation at the inception of the contract	Design & Planning	.672	7		
8	Fix penalty points for non-performance with applicable limits to SPVs before contract takeover by the client	Design & Planning	.424	8		
9	Teamwork should be intensified throughout the management of the project	Technical	.713	9		
10	Clarify key contractual clauses and key biding documents at contract inception	Design & Planning	.563	10		
11	Cancel PPP road concessions mainly characterised by aggressive and opportunistic bids	Tendering & Bidding	.393	11		
12	Develop an effective parameter or trust process during technical implementation that allows both parties to understand the impact of any renegotiation on the project objectives	Technical	.579	12		
13	Stipulate the renegotiation approach, criteria and process prior to contract formation	Design & Planning	.488	13		
14	Ensure a proactive, collaborative and analytical approach in the making and management of the contract to foster friendliness between and among the partners	Technical	.419	14		
15	Establish in the contract the right to evaluate and reject aggressive and reckless bids including submission of financial models for those bids or additional guarantees/financial bonds	Tendering & Bidding	.425	15		
16	Define adequate and strict criteria for contract award to discourage opportunistic and aggressive bidding	Tendering & Bidding	.457	16		

Table 7.12: Reliability Test on Measures to ensure VfM at Renegotiation (Contd.)

S/N	Measures	Category	Corrected Item-Total Correlation	Cronbach Alpha		ANOVA
				If Item is Deleted	Overall Coefficient	
17	Establish contract review processes and requirements with the aim of affecting defined or allowable changes to the contract	Design & Planning	0.193	0.941	0.941	0.001
18	Include in the contract agreement a contract award criterion which increase renegotiation request costs to the SPV's and make exit from the contract expensive	Design & Planning	0.24	0.942		
19	Establish outright contract takeover by the client due to non-performance of the SPV's	Design & Planning	0.221	0.942		
20	Proper constitution of qualified and knowledgeable panel of expert to manage aggressive bids, renegotiation request and conflicts	Administrative and Managerial	0.803	0.937		
21	Include a renegotiation clause in the contract agreement to foster financial equilibrium	Design & Planning	0.728	0.938		
22	Establish that the modification of the contract must ensure zero net present value (NPV) and must preserve VfM defined at contract formation.	Risk	0.017	0.944		
23	Establish in the contract that the modification of the contract, because of renegotiation, must not alter the VfM described or the risk allocation	Risk	0.399	0.94		
24	Establish the renegotiation reasons during the project implementation, to assist in ascertaining the impact of the factors or reasons on VfM	Technical	0.484	0.94		
25	Establish modalities for the submission of financial models required for evaluating aggressive bids or additional guarantees/financial bonds	Tendering & Bidding	0.508	0.939		
26	Include hand-back requirements by the public sector [i.e. salvage value/depreciation level allowed at delivery or handover]	Design & Planning	0.467	0.94		
27	Establish clear jurisdiction at high level over decision to renegotiate the contract	Regulatory	0.334	0.941		
28	Control aggressive bids by inclusion of larger performance bonds in the contract	Tendering & Bidding	0.535	0.939		
29	Include project plan reviews [e.g. every 3 years to monitor the performance of the project and particularly of VfM]	Design & Planning	0.593	0.939		
30	Ensure transparency of the renegotiation process	Administrative & Managerial	0.775	0.937		
31	Establish guidelines for levels of compensation applicable at strategic renegotiation points during project implementation	Design & Planning	0.695	0.938		
32	Request a mandatory bidding process for additional works or infrastructures including interest rate for PPP financing	Tendering & Bidding	0.623	0.938		
33	Prepare for contingent financing over time and throughout the implementation process because of viability gap funding	Technical	0.818	0.936		

Table 7.12: Reliability Test on Measures to ensure VfM at Renegotiation (Contd.)

S/N	Measures	Category	Corrected Item-Total Correlation	Cronbach Alpha		ANOVA
				If Item is Deleted	Overall Coefficient	
34	Outright contract takeover by the client due to non-performance of the SPV's	Technical	0.563	0.939		
35	Ensure that the contract risk matrix includes detailed risks identification and allocation	Risk	0.83	0.936		
36	Establish greater role of the PPP unit and regulatory agency	Design & Planning	0.614	0.939		
37	Include a freeze period for renegotiations [e.g. 2-3 years after contract award through the placement of embargo on materials & work standards, etc.]	Design& Planning	0.246	0.941		
38	Impose on the SPV's appropriate level of performance bonds [e.g. between 10-25% of the total PFI road project investment]	Risk	0.115	0.942		
39	Implement a transparent framework through increase of political costs to accept renegotiation demands	Political	0.729	0.937		
40	Provide allowance for extension of concession contract in austere and adverse economic situations	Economic	0.789	0.938		
41	Establish a reputation of less or non-disposal to renegotiation	Administrative & Managerial	0.551	0.939	0.941	0.001
42	Provide a statement in the PPP regulation establishing the inalterability of the contract risk matrix	Regulatory	0.698	0.938		

7.9 DISCUSSION OF GENERAL FINDINGS

The mean score of the survey reveals that the technical factors are the main factors leading to the renegotiation of the PFI (DBFO) road projects. This suggests that most of the renegotiation occurs at the technical implementation stage because the stakeholders mostly have good reasons at this point to renegotiate the contract. Factors leading to the renegotiation of the DBFO road projects at the technical stage mainly involve unexpected changes, as opposed to normal changes or events, which necessitates the renegotiation. The critical factors leading to the renegotiation are technical factors, followed by additional works during the implementation process. There is evidence of renegotiations occasioned by the impact of the environment and managerial action to comply with the current standards, which may be stated in the contract specification.

Critical factors in the technical category that can be seen in Table 7.5 include changes in works standards and modifications in the scope of works at the technical stage of project implementation. The main critical factors leading to the renegotiation include a change in the standards of works during technical development, change in the scope of works during the technical development, specification changes (e.g. change in the level of technical skills) and changes in infrastructure design, layout and programme during project execution. Moreover, additional works during construction (e.g. the requirement for extension or widening of the road network) and additional works during operation and maintenance (e.g. removal and replacement of assets, i.e. CCTV, speed camera) constitute significant critical factors leading to PFI (DBFO) road projects renegotiation.

This result is distinct from the non-critical factors leading to the renegotiation, which has inadequate transparency in the discharge of managerial duties, opportunistic bidding and bidding error during procurement. These findings contrast the supporting literature concerning the factors leading to renegotiation of PPP road projects in Latin American countries, Portugal and Spain, all of which include the non-critical factors identified in this research (Fatokun et al., 2015). The factors leading to the renegotiation of PPP road projects as identified in the literature include: regulatory, political, administration and managerial, design, contractual, economic and technical factors. These factors suggest the reasons why there are differing results regarding the outcomes of renegotiation in the literature and the empirical findings of this research.

The renegotiation of road concessions is found to have a high impact on the cost of construction, road users' satisfaction, project finance costs and operation and maintenance costs as shown in Table 7.6. These may be because of the changes and additional works that frequently occur at the technical stage.

These changes may be responsible for the variations in the cost at the insistence of those with renegotiation experience especially in the public client organisation. The least impacted VfM criteria are concession duration and concessionaires' profit, which requires no upward or downward reviews. There is a slight variation in the profit of the SPV. However, the variations and changes have not affected the VfM of the project for the public sector, as indicated by the respondents.

The primary outcomes of the renegotiation are increase in the user's satisfaction and the quality and performance of the concession product respectively. The fimding imply that the renegotiation has not benefitted one party to the detriment of the other, neither has the public sector been disadvantaged because of the renegotiation. These contrast the position of the literature, which provides evidence that the public sector's VfM objectives have not been realised (Ho and Tsui, 2009; Bi and Wang, 2011; Ho, 2006). The findings further suggest that road concession renegotiations can achieve VfM for the public sector if the critical measures identified in Table 7.9 are taken. There is a direct contrast to the findings of the literature, which show that the renegotiation incidences benefit the SPV and meet the profit maximisation objective of the private partner without achieving VfM for the public (Sarmento, 2014; Guasch et al., 2014).

The highly critical measures identified in Table 7.9 are mainly there to ensure VfM renegotiation. All the design and planning measures are to be considered and included in the contract, as they can serve as solutions and address the problem of VfM achievement in PPP road projects (Guasch et al., 2014). Since there is a higher percentage of renegotiation of PFI road projects are at the technical level of implementation, where specific factors usually lead the stakeholders to renegotiate the contract. VfM, therefore, needs to be conceived at the inception of the contract with terms and conditions incorporated into the contract as a clause for implementing its provisions at the technical stage of implementation prone to renegotiations. This is to ensure the achievement of VfM efficiently and more often.

7.10 SUMMARY OF THE CHAPTER

There is clear evidence that PFI (DBFO) road project gives satisfaction to the user's, which is the primary objective of the public client. Though, these finding is a direct contrast to classical renegotiation literature, which identifies non-achievement of VfM for the public sector. There is, however, evidence of an increase in construction cost, which suggest that the rise in the cost of construction may be because of the numerous changes and additional works necessitating renegotiations. VfM is usually ensured competitively, to foster the attainment of fair value for the client.

The chapter results indicate that design and planning measures are highly critical and essential at the inception of the contract as they tend to ensure the achievement of VfM at renegotiation, which mostly characterised the technical stage.

The need to develop a clear, concise and adequately written contract (e.g. specification of standards of material and components) amongst other things are the critical measures that would assist the achievement of VfM at the renegotiation of PFI (DBFO) road projects. Appropriate measures, as identified in this chapter, should be taken to ensure the achievement of VfM for the users. Renegotiation should be free from opportunistic behaviours of both parties (i.e., the client or the concessionaire) and aggressive bidding should be discouraged by the client as they are the non-critical factors to renegotiation that yield VfM for the client and the road users. A conscious effort at the design and planning stage through the adoption of all the appropriate design and planning measures will also ensure the achievement of VfM for users. There is also a need for proper appreciation, evaluation and a clear understanding of all the factors that may lead to renegotiation and the impact that such factors could have on the VfM criteria. The knowledge of the renegotiation factors will help the contracting parties to appropriately respond to any changes or amendments, which could jeopardise the achievement of VfM regarding satisfaction for the users, profitable returns to the concessionaire and anticipated residual value to the client.

CHAPTER 8 DEVELOPMENT OF A VALUE FOR MONEY RENEGOTIATION FRAMEWORK

8.1 INTRODUCTION

This chapter presents a critical evaluation of the research objectives 3, 4 and 5, which embody the factors leading to renegotiation, impacts of the renegotiation on VfM criteria and the outcomes of the renegotiation towards the fulfilment of objective 6, which is: *"to develop a VfM renegotiation framework for DBFO road projects."* The findings of the study inform the development of the framework. However, the gap identified in the literature and the results of the case studies serve as a guide and premise for the questionnaire design. The questionnaire, therefore, draws from the experiences and practices of PFI (DBFO) experts in the UK. The triangulation of the research methodological approaches, i.e. literature findings, case studies and the questionnaire ensure comprehensive and robust framework to guide the evaluation of renegotiation for value for money achievement.

The cumulative findings of these chapters (i.e., Chapters 2, 3, 4 and 6) in the questionnaire analysed, led to the VfM renegotiation framework developed and presented in this chapter. Therefore, quantitative research surveys conducted reveal the current state of PFI (DBFO) road projects renegotiation and provide extensive findings that are developed into a framework for the renegotiation of PPP road projects to ensure VfM achievement. The results suggest that there is a relationship between the factors leading to renegotiation and the outcomes. However, corrective actions can be taken to remedy observed deviations during the renegotiation process to ensure that renegotiation gives VfM for the project stakeholders, particularly the public sector. The chapter concludes with recommendations, including the need to adopt the framework principles and viewpoints, to ensure successful evaluation of road concession renegotiations for VfM achievement.

8.2 THE NEED FOR A VFM RENEGOTIATION FRAMEWORK

Value for Money is critical because it is the principal objective of any government during PFI infrastructure project delivery. Procuring authorities are seeking to ensure that there is the provision of infrastructure services to members of the public and road users to meet the required level of satisfaction.

The achievement of VfM in PPP road projects should be given more attention in consideration of the level of financial requirements involved and the frequent renegotiations, which has generated VfM achievement questions as discussed in the literature review sections, especially Chapter 3 of this thesis. Therefore, the need for a framework that will aid renegotiation of PPP road projects to foster VfM achievement because of the challenge of PPP renegotiation becomes imperative. Though the outcomes of the renegotiations in PPP road projects as recorded in the literature indicates poor or non-achievement of VfM, especially for the public sector, however, the empirical data of PFI (DBFO) road projects renegotiation in the UK reveals the innovations and practices, which have advanced the course of the industry regarding VfM achievement in the road sector. The gap in the literature and the findings based on the innovations and practices in the UK PFI (DBFO) road sector assisted in establishing justification for the necessity and feasibility of a VfM renegotiation framework.

The following questions become pertinent in the development of a new framework to fulfil the objectives for the correct evaluation of renegotiation for VfM achievement.

- What are the factors leading to the renegotiation and how can the assessment of their applicability to a specific project be done?
- Can the renegotiating stakeholder ascertain the level of criticality of the factors leading to renegotiation? If so, how?
- What are the renegotiation outcomes? How are they assessed to determine whether VfM is achieved or not for the primary stakeholders, especially the public-sector client?
- Can we have a relationship between the factors leading to renegotiation and the renegotiation outcomes?
- What are the remedial actions that can be taken to correct deviation from the achievement of VfM at the renegotiation of PPP road projects?
- Are there measures that can be considered to ensure that there is the achievement of VfM during the renegotiation process?
- Who are the primary renegotiating stakeholders in road concessions?

8.3 THE PROPOSED VALUE FOR MONEY RENEGOTIATION FRAMEWORK

The research adopts the principle of the constructionist approach in the development of the framework. Thompson et al., (2014) justifies the use of constructivist grounded theory approach to develop the rationale for a continuum between two spheres of stakeholder's opinion towards the achievement of a conclusion on conceptions of clinical practice in osteopathy through a constant comparative method of data analysis and coding.

Hence, the VfM renegotiation framework evolves through the sampling of the initially selected participants for both the interview and questionnaire survey. The theoretical sampling as dictated by the details of DBFO roads and highway maintenance projects in the UK collected from the PPI database informed the data collection and analysis, which allowed the sampling of specific participants. The data collection methods involved semi-structured interviews of a range of users in the public and private sector. The interviews were conducted face-to-face, via Skype and on the phone as it deemed convenient for the interviewees. These interviews were audio-recorded and later transcribed.

The findings of the literature review, therefore, serve as the basis of the pilot interviews conducted at the initial stages of the research. The conclusions of the case studies and literature were adopted comparatively in the development of the questionnaire. Hence there is the triangulation of the findings of previous research and the case studies in the questionnaire survey towards the development of the VfM renegotiation framework. The developed VfM renegotiation framework was refined appropriately based on the suggestions of the participants that are involved in the initial stages of the study (i.e., internal participants) and those that are invited but did not participate in the initial stages of the study (i.e., external participants).

The triangulated results of the research afford the opportunity for a robust conclusion regarding PFI (DBFO) road projects in the UK and ultimately in the development of the framework. The framework was developed in the form of a flowchart because it gives a vivid picture of a system of evaluation, showing the flow of information. Arrows point from source to destination. The indexed rectangles at the top represent respective renegotiation sections, and each section indicates the individual progression to the making of decisions during the implementation of the project. Moreover, the flowchart is simple to understand and straight in the conceptualisation of high-level design. The diagram showing the framework describes the overall operation of the evaluation process and indicates the details of how the structure works. The validated framework proposed for the evaluation of PFI (DBFO) road projects renegotiation for VfM achievement is, therefore, shown in Figure 8.1.

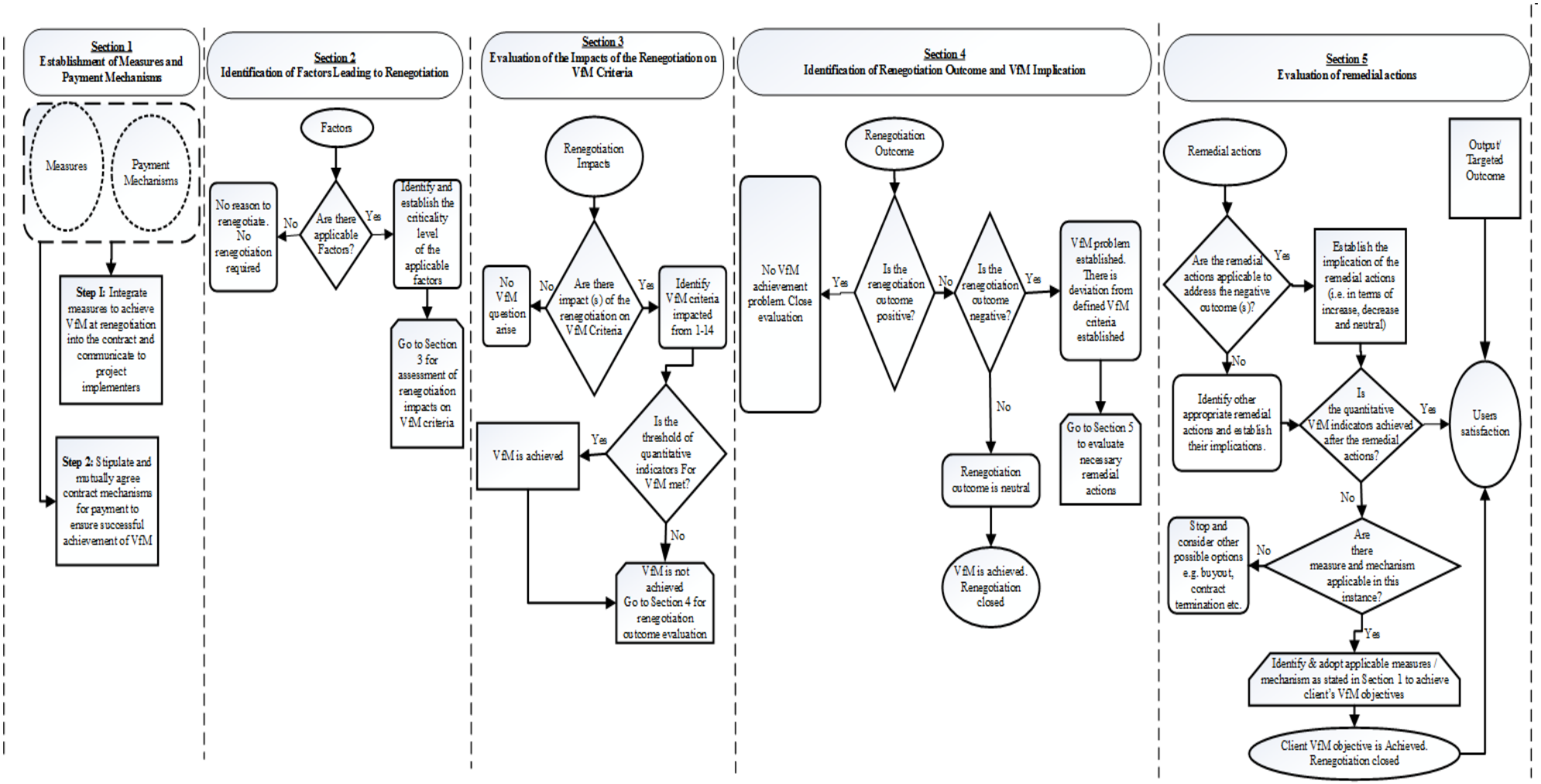

Figure 8.1: Value for Money Renegotiation Framework

The flexibility and practicability of the framework arise from its ability to ensure that the different innovative levels and perspectives of the respective component sections of the questionnaire are incorporated as reflected in the findings. Discussions about each of these component sections are in the succeeding subsections of this thesis, which are in the individual parts: 1, 2, 3, 4 and 5. These sections represent areas where the parties involved in renegotiation address value for money within the scope of renegotiation and outline points that are germane to the objectives of the projects as stipulated by the client. The identified sections of the framework, as shown in Figure 8.1 serves as the pedestal and guide for the stakeholders during the implementation of PFI (DBFO) road projects. Each of the sections of the framework is explained in the succeeding sub-sections as follows:

8.3.1 Section 1 – Establishment of Measures and Mechanisms for Payment

The first section of the framework identifies the need for the stakeholders to define and establish at the inception of the contract the measures that the stakeholders will adopt in the event of renegotiation during the implementation of the agreement. In addition to the definition of standards for renegotiation, the findings of the case studies indicate that there are contract mechanisms used for payments that foster the achievement of VfM for road users (See Sub-section 6.4.7). The need for the establishment of the applicable contract mechanisms for payments during the implementation of PFI (DBFO) road projects cannot be over-emphasised to ensure the achievement of VfM. The current practice indicates that the client is solely responsible for the definition of contract mechanisms used for payment. However, there is the need for the description of measures that will guide the primary stakeholders at renegotiations and serve as platforms to address any emerging issues at the point of renegotiation. The intention of the stakeholders for the inclusion of the measures and mechanisms at contract inception should be to facilitate the achievement of VfM during implementation and, especially, at the point of renegotiation. The contract mechanism for payment in DBFO roads are defined in the contract by the client, and it usually relates to shadow toll, availability payment, and active management payment mechanisms (See Figure 4.1 and Table 6.9).

There should, therefore, be an appropriate definition at the contract inception of all the available measures (See Table 7.9) and payment mechanisms that can assist in the achievement of the client's VfM objective. The measures and payment mechanisms are defined for significant adoption and evaluation of renegotiation and change negotiation during the execution of the project. The use of the framework for renegotiation purposes should follow the provisions of Section 1, which may be available for use in Section 5 as shown in Fig 8.1. The framework template for this aspect of the renegotiation process is shown in Table 8.1.

Table 8.1: Template for Section 1 of the VfM Renegotiation Framework

S/N	Measures & Mechanisms	Are the measure and Mechanisms adopted on this project?		Indicate the level of Criticality				Evaluation Criteria			Responsible Stakeholders	
		Yes	No	VC	C	MC	NC	E	I	NEI	Client	SPV
A	**Measures**											
1	Design and Planning											
2	Tendering and Bidding											
3	Technical											
4	Managerial and Administrative											
5	Economic											
6	Contractual											
7	Risk											
8	Regulatory and Legal											
10	Political											
B	**Mechanisms**											
1	Shadow Toll											
2	Availability											
3	Active Management											
4	Others (Please specify)											

Key: VC = Very Critical, C = Critical, MC = Moderately Critical, NC = Non-Critical,

E = Effective, I = Ineffective, NEI = Neither Effective or Ineffective

There is the need to check whether the measure identified at the inception of the contract for use during renegotiation is relevant and applicable to the project. The measure could be applied to the project if it is very critical or critical to the achievement of VfM for the primary stakeholders, especially the public sector at renegotiation. Some of the renegotiation measures may be non-critical for the realisation of VfM objectives defined by the procuring authority. There is the need to ascertain the effectiveness level of the adopted measure towards the achievement of VfM at renegotiation. For instance, a renegotiation measure can be observed by the client's representative as applicable in a renegotiation instance in such a way that it will enhance the prospect of

achieving VfM for the client and ultimately the road users. Such measures can, therefore, be recommended for adoption by the appropriate stakeholder on a PPP road project towards ensuring the achievement of VfM. Moreover, a mechanism established in the contract, e.g. safety performance mechanisms may forestall safety of road users on the network while the lane closure charges may discourage closure of the road by the SPV by fostering the availability of the road users. The availability of the project output to users always results in users' satisfaction, which is the primary objective of the client. Therefore, the measures and mechanisms for payment considered appropriate need to be stated and defined in the contract and ready for adoption in the event of renegotiation.

Summarily, there is a need to specify the measures at the inception of PPP road projects to ensure that appropriate guidance notes are in place to address the problem of VfM inherent in PPP renegotiation. Since most of the measures to achieve VfM at renegotiation are observed to be design and planning related in the context of UK PFI (DBFO) road projects, there is a need for the design and planning measures to be stipulated to address renegotiations, which usually characterise the construction stage (See Table 7.5). The adoption of design and planning measures will ensure favourable renegotiations for all stakeholders, especially the public sector. Hence, this first step of the framework justifies the need for a motivated design and planning measure that promotes and fosters the achievement of VfM at the construction stage of the PFI (DBFO) road projects renegotiation in the UK. The reason for this submission is on the fact that most renegotiations in the context of UK occur at the technical development stage of the PFI (DBFO) road projects implementation.

8.3.2 Section 2 - Identification of Factors and their Criticality Level

The emerging factors from the study are in Table 8.2. Altogether, there is the identification of thirty-seven factors in the context of UK PFI (DBFO) road projects, and they were accordingly categorised into twelve sections (See Table 7.5). In this empirical research, the category of the factors identified as leading to the renegotiation of road concession projects are technical, additional works, environmental, administrative and managerial, tendering and bidding factors, in their decreasing order of significance respectively.

There is the need for the evaluation and assessment of the factors leading to renegotiation because of the importance of fostering an understanding of the renegotiation motivators and the reason why the primary stakeholders initiate the renegotiation request. An understanding of the answer to the question *"Why renegotiate?"* will benefit the stakeholders and assist in the knowledge of the renegotiation influence factors in the context of the project under investigation as established in the framework.

The framework operates based upon the need to identify the relevant factors from the list of thirty-seven factors that may lead to the primary stakeholder's decision to renegotiate the contract. The reason for the identification of the respective renegotiation factors is on the comprehensive list in this study, most of which may not apply to some road concessions and may not represent the factors leading to the renegotiation in a specific project. For example, a cursory view of the factors influencing the renegotiation of the case studies indicates a maximum of eight, as stated by XY3-Pub and XY8-Pub in CS2 and CS5 respectively, which leads to the renegotiation of the road concessions (See sub-section 6.4.2). These eight factors only represent a fraction of the thirty-seven factors, which could lead to the renegotiation of road concessions. Hence, there is the need to identify the applicable factors, which are in the context of the PFI (DBFO) road projects under investigation.

During the evaluation and assessment of the factors leading to renegotiation, specific reference to those factors, which are relevant to the project, from the list of possible factors that could lead to renegotiation as outlined in Table 7.5. The next step is to ascertain the critical levels of the identified factors leading to the renegotiation of road concessions after establishing the relevant factors influencing the renegotiations. The reason for the evaluation of the essential levels is to ensure the level of significance of these factors concerning the definition of their respective degree of influence on the road concession renegotiations. This evaluation, therefore, needs to proceed from the most critical to the non-critical factors, as shown in Table 7.5.

The establishment of the respective critical levels will assist in defining a deeper understanding of the factors, which contribute to the results achieved in their respective degrees and criticality. The reason for this evaluation is based on the literature, which identifies that specific factors constrain successful implementation of PPP road projects, especially regarding VfM achieved at renegotiation (Domingues and Zlatkovic, 2015; Nikolaidis et al., 2013).

The findings of CS2 further reveal that the client is the primary stakeholder’s responsible for making all the renegotiation requests that on the factors identified in Table 8.4. The renegotiation experience of this case study project reveals that the following are considered essential and necessary in the development of factors leading to the renegotiation of PPP road projects:

- The assessment of the renegotiation factors applicable to the project (See Sub-section 6.4.2).
- The evaluation of the criticalness of the factors leading to renegotiation (See Table 7.5).
- The stakeholders that are responsible for the renegotiation requests, which on the identified factors (See Sub-section 6.4.3)

The reason for the evaluation of the factors leading to renegotiation is to ensure that the correct factors inform the decision of the primary stakeholders to renegotiate the contract. The successful establishment of the chief factors influencing the renegotiations will help in the comparison of the factors leading to renegotiation with the VfM achieved at renegotiation. The evaluation of the factors leading to renegotiation according to Section 2 of the framework should, therefore, follow Figure 8.1 as expanded in the template shown in Table 8.2.

Table 8.2: Template for Section 2 of the VfM Renegotiation Framework

S/N	Category of Factors	Is the factor applicable to your project?		Indicate the level of criticality of the factors				Responsible Stakeholders	
		Yes	No	VC	C	MC	NC	Client	SPV
1	Design and Planning								
2	Technical								
3	Economic Factors								
4	Contractual								
5	Tendering and Bidding								
6	Administrative and Managerial								
7	Institutional								
8	Regulatory and Legal								
9	Political								
10	Environmental								
11	Social								
12	Others (Please Specify)								

The stakeholder evaluating the factors leading to renegotiating should use Table 8.2 and consider the sub-factors under each of the categories of factors (See Table 7.5) to identify the factors applicable to the project and their respective level of criticality.

8.3.3 Section 3 - Establishment of Renegotiation Impacts on VfM Criteria

The combined evidence of the literature and the interviews conducted identifies that the renegotiation of road concessions has an impact on the VfM criteria. One of the measures in Section 7.7 of this thesis is the definition of the criteria's of VfM in the contract at inception. The evidence of this empirical study establishes fourteen (14) criteria's of VfM (See sub-section 7.5).

These criteria's can be used to assess the renegotiation of PPP projects for VfM achievement. Experiences of the PFI road concessions in the UK indicates that the renegotiations, which occurred on the project, are observed to impact all the fourteen identified VfM criteria, which include the construction cost, Operation and Maintenance (O&M) cost, project finance cost, the cost of risk transferred and whole life cycle cost at different levels. The evaluation criteria used to measure the degree and level of impacts of the renegotiation on the VfM standards are considered to also be regarding their respective criticalness. The primary effects of the renegotiation are in comparison to the other impact of the renegotiation. Therefore, there is a comparative basis between the individual criteria of VfM and the VfM requirements of the project, which have the tendency to be impacted by the renegotiation.

Based on the findings of the empirical research, there is a need for the identification and establishment of the impacts of the renegotiation by the primary stakeholders regarding each of the identified VfM criteria. The fourteen (14) VfM criteria can be used on an individual basis to evaluate the implications of the renegotiation. For instance, the cost is the most impacted VfM criteria during the renegotiation of road concessions. Therefore, the findings suggest that all the requirements related to cost needs to be evaluated and assessed as an essential VfM criterion that should be given due consideration and protected when renegotiating road concession contract for VfM achievement. Establishing the impacts of the renegotiation, mainly by the cost criterion, is paramount as most of the renegotiations from the empirical findings impact the cost components while the time criteria remain un-impacted in most instances.

The principle of this framework in the evaluation of VfM at the renegotiation of PPP road concessions identifies the need for the identification and assessment of the respective impacts of the renegotiation. The renegotiation impacts should be about the individual criteria of VfM, which are necessary for the evaluations and assessments required in PPP road projects. The purpose is to assist in the assessment of the impact levels of the renegotiation regarding the VfM criteria to ensure that the renegotiating stakeholder's objectives including, profit, budget and cost perspectives are not affected or altered to the detriment of client objective and ultimate satisfaction of the users. The reason for the assessment of renegotiation impacts is to assist the understanding of the direction of the VfM achieved for the stakeholders. The establishment of the effect of the renegotiation on the individual VfM criteria can follow the flowchart shown in Section 3 of Figure 8.1, which is in Table 8.3.

Table 8.3: Template for Section 3 of the VfM Renegotiation Framework

S/N	Category of Factors	Is the factor applicable to your project?		Indicate the level of criticality of the factors				Responsible Stakeholders	
		Yes	No	VC	C	MC	NC	Client	SPV
1	Construction cost								
2	Project finance cost								
3	Operation and Maintenance costs								
4	User satisfaction								
5	Private sector management expertise								
6	Whole Life Cycle Cost								
7	Construction duration								
8	Cost of risk transferred								
9	Quality of Service Delivery								
10	Competition that provides fair value of the project								
11	Performance based payment mechanism								
12	Innovation of bidders in the use of output specification								
13	Concession duration								
14	Concessionaire's profit								

8.3.4 Section 4 - Identification of the Outcomes and their Characteristics

The fourth section in the evaluation of renegotiation of road concessions is the identification of the relevant outcomes that apply to the project from the list of possible outcomes of the renegotiations (See Sub-section 7.6). The appropriate assessment of the outcomes should focus on the specific road project(s) in context. These renegotiation outcomes as indicated by the stakeholders involved in the renegotiation of the road concessions in the particular case studies. Reference to the results of the renegotiation regarding variances in the respective VfM criteria. The evaluation of the outcomes of the renegotiation is, therefore, concerning the principle of establishing the positivity, negativity or neutrality of the renegotiation as shown in Figure 8.1. This assessment further applies to the process of verifying the result of the renegotiation based on the impact of the renegotiation on the VfM criteria.

Thus, when evaluating the outcome of the renegotiation for VfM achievement, there is the need to have prior knowledge of the specific VfM standards that is impacted by the factor leading the

stakeholders to agree to the renegotiation of the project. The VfM criteria are, therefore, adopted as the basis for establishing the positivity, negativity and neutrality of the renegotiation outcome. For instance, these evaluations entail the establishment of whether there is an increase or decrease in the cost variables (e.g. construction cost, whole life cycle cost, concession cost and cost of finance) at renegotiation. It is also crucial that the evaluation of the renegotiation outcome takes into consideration the possibility of achieving neutrality of cost (i.e., no change in the cost of construction, concession cost, and whole life cycle cost amongst others). For instance, there can be a review of the performance-based payment mechanisms, quality and performance of concession as well.

One or both primary stakeholders can make renegotiation requests in road concession projects and carry out an estimation of an increase or decrease in costs criteria. The evaluation of costs ensures that the outcome of the renegotiation is measured to ascertain whether it is profitable for the stakeholders, especially the public sector, regarding the achievement of VfM in those criteria, as defined at contract inception. In other words, the renegotiation could affect the cost of the concession contract through an increase or decrease in price. Moreover, the findings on the renegotiation of road concession contracts indicate that there is an increase in concession costs because of the inclusion of additional works and cost savings premised upon the removal of assets, showing an increase and decrease in concession cost respectively.

Despite the increase in construction costs, the overall concession cost and duration of the contract remain unchanged (i.e., there is the achievement of VfM for the public sector considering the outcomes), regarding the criteria, have been established by the client for measuring the successfulness of renegotiation. The submission of XY2-Pri in CS2 adds credibility to the findings of this empirical study as discussed in Sub-section 6.4.5: *"There is an early completion of the construction, and on the budget and to date there have been some minor issues and some naggings about some defects rather than overall quality. No impact on the 30-year concession. Therefore, the concession contract remains for that 30-year period."* This occurrence justifies the principle propounded in this framework, which establishes the need to develop the outcomes of the renegotiation of PPP road projects regarding the positive and negative values of the respective VfM criteria. The evaluation of the results of renegotiation can be done using the template shown in Table 8.4.

Table 8.4: Template for Section 4 of the VfM Renegotiation Framework

S/N	Outcome	Is the outcome applicable to your project?		Indicate the nature of the outcome			Responsible Stakeholders	
		Yes	No	Positive	Negative	Neutral	Client	SPV
1	Construction Cost							
2	Construction Duration							
3	Operation and Maintenance							
4	Project Finance Cost							
5	Cost of Risk Transfer							
6	Users Satisfaction							
7	SPV's Profit							
8	Quality and Performance							
9	Whole Life Cost							
10	Concession Duration							
11	Performance Based Payment Mechanisms							
12	SPV Management Expertise and Skills							

8.3.5 Section 5 – Evaluation and Application of Remedial Actions

There are specific actions that have been found necessary at the renegotiation stage to introduce equilibrium and ensure that deviations from the stakeholder's objectives are minimised or corrected. These efforts serve to remedy the non-achievement of VfM, which may arise during the process of renegotiation of PPP road projects. The critical remedial actions regarding VfM criteria identified from the results of the questionnaire are in Table 8.6. There may be a need for corrective action to be taken based upon the experience of renegotiations, as clearly outlined in the findings of this study. Moreover, the literature reveals that there could be the need to rescue the project financially or rebalance the financial equilibrium of the project because of the outcome of renegotiations (Sarmento and Renneboog, 2016; Sarmento 2014).

Therefore, remedial actions are necessary during the renegotiation of road concessions to make sure the road projects are on the track of VfM achievement for the procuring authority as well as the private concessionaire. Non-achievement of VfM during the renegotiation of PPP road projects can be avoided or reduced through remedial actions suggested in this sub-section, which ensures the satisfaction of stakeholders' objectives regarding the achievement of VfM. However, other options, which include contract termination, buyout and refinancing are available in a situation where the stakeholders could not identify any appropriate actions that can address renegotiations to ensure the achievement VfM. These options are, however, outside the scope of this research, which seeks how to achieve VfM within the confine of road concession renegotiation. Thus, the findings of this empirical research on the variables grouped in their respective sections are incorporated and evident in Figure 8.1. All the individual tables (i.e., Table 8.1, Table 8.2, Table 8.3, Table 8.4 and Table 8.5) serve as templates that can be used to enhance the practical application of the framework shown in Figure 8.1. However, the detail components of the framework regarding the format to follow in the evaluation of remedial actions to address deviation from VfM criteria are in Table 8.5.

Table 8.5: Template for Section 5 of the VfM Renegotiation Framework

S/N	Remedial Actions	Is this the action taken on the project?		What is the type of action taken?						Responsible Stakeholders	
		Yes	No	Increase Evaluation			Review Evaluation			Client	SPV
				Increase	Neutral	Decrease	Upward	Neutral	Downward		
1	Government direct compensation/ subsidies to the SPV										
2	Bonus point issued to the SPV as a penalty										
3	Redefining of investment plans by the SPV										
4	Financial rescue of the project by the government										
5	Adjustment in the annual fee paid by the operator to the government										
6	Innovation of bidders because of the use of output specifications										
7	Concession duration										
8	Competition among the bidders										
9	Revised service delivery modalities										
10	Question regarding the credibility of renegotiation process to deliver VfM for the public sector										
11	Others (Please Specify)										

8.4 THE USE OF THE FRAMEWORK FOR THE RENEGOTIATION OF PPP ROAD PROJECTS

The stakeholders involved in the renegotiation can use the framework for the practical assessment and evaluation of PPP road projects to ensure the achievement of VfM for the users and achieve the individual objectives of the stakeholders. The stakeholders can successfully use the framework during the renegotiation process by the definition and establishment of the measures and mechanisms for payment regarding the project under consideration. The defined rules can be used during the implementation of the plan and assessed for their level of effectiveness. The performance of the project during implementation by the criteria defined for VfM will not require renegotiation measures to be taken by the private and public partners. The reason why there may not be a need for renegotiation may be because the project aligns with the VfM requirements and achieves the intent of the stakeholders regarding the defined VfM criteria used to measure the project VfM success. Otherwise, there will be the need to use the VfM renegotiation framework for evaluation to align the project based on the defined requirements for VfM.

The framework can also be used to establish the process of evaluating the relevant factors leading to renegotiation of PPP road projects. Every road concession project is unique. Therefore, there is the need for the stakeholders to identify the factors influencing renegotiation during implementation. For instance, the framework stipulates, as stated in Sections 2, that the stakeholders need to determine whether there are applicable reasons to commence a renegotiation process. If no justifiable factors are leading to renegotiation, renegotiation requests should be declined and stopped by the client. However, if it is satisfactory to the client that there are reasonable and genuine reasons for renegotiation, most of which could apply to the provisions of the contract, the client can agree and approve the renegotiation request. In this instance, renegotiation will be by the consent of the initiator and the second party to the contract including any other party to the process.

The evaluation of the factors leading to renegotiation, therefore, requires the primary stakeholders to identify the applicable factors from the list of thirty-seven factors that can lead to the renegotiation of road concessions identified in Section 7.4 of this thesis. The reason for this is because all the factors cannot all constitute the factors leading to road concession renegotiations in the specific project. After determining the applicable factors, the next step is to ascertain the criticality of the factors by estimating the significance levels of each.

The estimation of the significant level of the factors will foster the understanding of the factors in their respective order of prominence, including the very critical and non-critical factors leading to the renegotiation. However, there is the need for the stakeholders to ensure that there are accurate identification and establishment of the level of criticality of each of the factors identified as responsible.

The next thing after the evaluation and assessment of the factors leading to renegotiation is to establish the impact of the renegotiation on the VfM criteria defined for the specific road concession project. The effect of the renegotiation because of the factors identified in Section 2 of the framework is significant for an understanding of the nature of the renegotiation. The reason for the impact assessment is on the knowledge that all the criteria listed in the VfM renegotiation framework may not apply to the specific PFI (DBFO) road projects. Hence, there is the need to identify the impacts of the renegotiation on defined VfM criteria outlined at the contract formation stage to establish whether there is the achievement of the threshold of VfM or performance indicator.

The outcome of the renegotiation can also imply the result of the renegotiation. For instance, in a situation where there is the achievement of the threshold of the quantitative VfM indicator, the renegotiation is positive. However, in a case where there is no achievement of the limit of the quantitative VfM index, the renegotiation outcome is reckoned as negative. Positive renegotiation outcomes in PFI (DBFO) road projects renegotiation indicates that there are no problems regarding the achievement of VfM regarding the objective of the client. Also, the renegotiation outcome is positive if the SPV achieves the profit and revenue expected after the renegotiation or change negotiation. Hence, a positive renegotiation is one where both parties are happy at the end of the renegotiation. In this instance, the evaluation of the renegotiation for VfM achievement ends. However, if the outcome is adverse, there is a deviation from the quantitative or qualitative indicator of VfM, which indicates that there is a VfM achievement problem (See Section 4 of Figure 8.1). Though, the renegotiation outcomes, as outlined in Table 8.4, can come in any three forms: positive, neutral and negative.

The deviation from the quantitative and qualitative VfM indicator, which is in the failure to meet the criteria set for VfM indicates that there is a need for the stakeholders involved at renegotiation to go to Section 5 of the framework to commence evaluation of relevant remedial actions. Having identified the appropriate steps that need to be taken to correct the deviation observed in the criteria defined for VfM, the next thing to do according to the provisions of the framework is to evaluate the implication of the remedial actions identified. The impact can either be evidenced in the increase, decrease or a neutral result of the specific VfM criteria defined in the contract.

If the public client is satisfied that there is the achievement of the quantitative VfM indicator after the corrective action, then it is assumed that the road users will be happy. Hence, there is the achievement of the VfM renegotiation framework targeted outcome in this instance after the adoption of suitable and necessary actions to remedy the deviation and foster project performance. In a situation where there is non-achievement of the quantitative indicator of VfM, there will be the need for the renegotiating stakeholders to go back to Section 1 of the framework to identify the applicable measures and payment mechanisms agreed at the contract formation stage to ensure that VfM is achieved for the public client (See Sub-section 8.3.1). The adoption of the applicable measures and payment mechanisms, which could include penalties and bonuses to the SPV are mainly to ensure that there is the achievement of VfM for the road users. VfM is obtained for the client and the procuring authority in PPP road project when the measures and payment mechanisms are found to be useful during the renegotiation and change negotiation of PFI (DBFO) road projects. Thus, the user's satisfaction, which is the primary objective of the client is achieved at the end of the evaluation as shown in Figure 8.1. The framework is proposed for use by the client and the private concessionaire during road concession renegotiation, especially when there is the need for contract renegotiation and change negotiation.

8.5 VALIDATION AND REFINEMENT OF THE VFM RENEGOTIATION FRAMEWORK

The validation of the developed framework was through interviews of a range of users in both public and private sectors after the modification of the developed framework as recommended. Feedbacks received on various issues that are pertinent to renegotiation and each of the sections of the framework through face-to-face interviews, Skype and phone calls as agreed with interviewees were used in the framework validation. Seven experts recognised as potential users of the framework indicated interest to participate in the semi-structured interviews out of the twenty-four public and private sector experts invited. Six of the experts are involved in PFI (DBFO) road projects in the UK. Ten pre-determined questions were asked to validate the framework. These questions aim to assess the framework regarding its relevance and ease of understanding, general comprehensiveness and level of coverage including the applicability and usefulness of the framework. The potential users provided more in-depth and insightful comments, which assisted in refining the proposed framework and helped in developing a modified framework, which incorporated salient user's suggestions.

The experts' opinion and feedback provided the basis for the internal and external validity of the developed framework. The potential users of the framework from both the public and private sector include those that participated in the interview surveys at the advanced stage of the research, (i.e., case study interviews). Also, experts external to the development of the framework, i.e., potential users of the framework that are not part of the initial study leading to the development of the framework. The aim was to identify, whether there is a significant difference between the views of those that have participated in the study and those that did not participate in the study. The feedback from the experts who participated in the study served the purpose of establishing the internal validity, while the input from experts that did not participate in the research confirm the external validity of the framework.

In addition to the framework validation, the various presentations made at academic conferences and seminars that are peer-reviewed serve as opportunities for fair critique and scrutiny of the findings and methodology of the study by experts in PPP research. Valuable feedback and comments were received from reputable and international academic conferences attended (See Appendix 5). The suggestions received were evaluated and integrated into the study to improve the validity and comprehensiveness of the research findings. Before the conduct of the validation interviews, the developed framework and the validation questions were mailed electronically to the potential users in the public and private UK PFI (DBFO) road sectors. The essence was to introduce the validation exercise, the process and to solicit their consent.

The validators are experts involved in PFI (DBFO) road projects in the UK. The reason for the choice of these experts is to ensure that they have adequate knowledge in framework development including issues about renegotiation of PFI (DBFO) road projects. The number of private sector potential users chosen was 12, and the number of public sector potential users was 12, which cumulated to a total of 24 potential users of the framework developed. There is an extensive consultation to allow for robust suggestions and useful feedbacks for incorporation into the initially developed framework. However, only seven potential users willingly indicated interest and gave their consent to participate in the validation process. The validation interview questions reflected semi-structured open and closed-ended questions (See Appendix 11) and covered a range of issues involving three aspects, which include|:

- Section A - Preliminary questions.
- Section B - Relevance and ease of understanding of the framework.
- Section C- Applicability and usefulness of the framework.

The general responses received from the range of users interviewed during the validation exercise reflect positive feedback and comments on the overall framework and its respective sections including its applicability, usefulness in the evaluation of renegotiation for VfM achievement. The experts and potential users in both the public and private sectors identified the framework as new, innovative and a novel contribution with clear and thorough considerations of pertinent issues that usually emerge during the renegotiation and change negotiation of PFI (DBFO) road projects. The interviewees agreed that the framework has a high level of coverage of issues to be considered during the renegotiation of PFI (DBFO) road projects to ensure the achievement of VfM for the users. A general review of the overall responses of the interviewees regarding each of the sections of the framework reveals that the interviewees confirmed the relevance, ease of understanding, and the applicability and usefulness of the framework in the evaluation of renegotiation for VfM achievement. Though, there are suggestions from the interviewees, which are adapted to refine the structure and incorporated into the appropriate sections of the framework developed. Some of the critical comments of some of the interviewees, which assist in the refinement of the framework developed are:

- ✓ VR1-Pri - *"The lane occupation charges, have ensured the achievement of the client's objectives of non-disruption to the road network including the performance of the standards specified in the contract. Few incidences of disruption to the road network have benefitted the users regarding journey time reliability. I feel that it would be useful to expand Section 1 of your flowchart to address how some flexibility could be built into the contract from the outset, to allow either party to introduce proposals that enhance VfM, with shared benefits"*.
- ✓ *VR3-Pub - "As the focus of this framework is on renegotiation and as the two options highlighted in the framework are not the only options – it seems extreme to me. I am not sure if you can achieve a VfM by re-financing renegotiation or change negotiation. You are contractually allowed to terminate the agreement. As such termination should not be stated, in that extreme way in the framework, especially in a framework whose purpose is to devise a strategy to achieve VfM for the stakeholders".*
- ✓ VR4-Pri - *"I think the framework is useful; the only thing is just the definitions of the terms used in the sections of the framework. If you use this framework, it should develop from the parties to be involved in the renegotiation. The use of the framework should be such that it will be refined by the renegotiation stakeholders as renegotiation go on. It could be handy during the project implementation"*.

- ✓ *VR6-Pri "So, our payment mechanism is very much about VfM. It is about keeping the road open and keeping the traffic flowing up to the stipulated average speed and keep it going safely. It is already a built-in payment mechanism to ensure VfM achievement".*

8.5.1 Preliminary Questions of the Interviews

The preliminary questions seek to elicit information regarding the experiences and background of the validation participants to establish the quality of the responses provided for the framework validation. There are two categories of participants adopted for the framework validation. The first category of participants is regarded as study participants because they participated in the interview and questionnaire survey and their opinions were used to establish the internal validity of the framework. The second category involves stakeholders that did not participate in either the interviews or the questionnaire, but their responses were used to establish the external validity of the framework. Hence, the opinion of the non-study participants serves as an objective basis to compare the reactions of the first category of interviewees.

The details of the participants with regards to their respective categories, the code assigned to each participant, stakeholder sectors, the current position of the validation respondents, their years of experience and academic and professional qualification are in Table 8.6.

Table 8.6: Details of the Validation Respondents

S/N	Practitioners Category	Participants Code	Stakeholders Sector	Current Position	Years of Experience	Qualification
1	**Practitioners (Study Participants)**	VR1-Pri	Private	General Manager	21	BSc, Civil Engr. FICE
		VR2-Pub	Public	Client Representative	13	Chartered Engr.
		VR3-Pub	Public	Head of Operations	10	BA Bus. Mgt.
		VR4-Pri	Private	General Manager/Director	40	BSc Civil, FICE
2	**Practitioners (Non-study participants)**	VR5- Pri	Private	Industry practitioner/Researcher	20	Ph.D.
		VR6-Pri	Private	Operations Director	22	MICE. Engr.
		VR7-Pri	Private	Operations/Liaison Manager	40	BSc, Civil Engr MICE

Table 8.6 shows that all the respondents have broad academic/professional background and extensive experience in the industry, especially in the management of PFI (DBFO) road projects for the client and concessionaire. Participants currently working for the private sector concessionaires have, at some point in their careers, worked for the public client. For instance, VR7-Pri and VR4-Pri indicated regarding their experience in the public sector as follows:

- *"I am a Chartered Engineer and a Member of the Institution of Civil Engineers. I have three years of experience as Highways England's Department's Representative on the Newcastle to Carlisle DBFO road project. This role was working for the Client. I also have nine years of experience working as the Operations & Liaison Manager."*
- *"I have got 40 years' experience in the design, construction, operation and maintenance of highways altogether. For 20 years, I have worked on PFI (DBFO) road contract in the UK."*

The experiences and backgrounds of the respondents as indicated in Table 8.6, therefore, suggest that the responses are reliable for both public and private sectors application.

8.5.2 Relevance and Ease of Understanding of the Framework

The interviewees agreed that the framework has a high coverage of issues relating to the measures that can ensure the achievement of VfM at the renegotiation of DBFO contracts, including actions that can be taken to remedy deviations from the VfM target, stipulated by the client. During the review of how the framework can assist in the assessment of renegotiation for VfM achievement, it was understood that the framework adopted considerations within the individual sections, which can be useful in the process of renegotiation. The participants also agree that the framework can serve as a guide for the stakeholders and ensure sustainable progress towards the achievement of the user's satisfaction. Overall, the interviewees confirmed that the framework presented a useful flow chart that shows originality and novel contribution that can be used in practice by both the public and private sector stakeholders for the evaluation of renegotiation for VfM achievement in PFI (DBFO) road projects. Moreover, some of the comments of the interviewees regarding the relevance and ease of understanding of the framework are:

- ✓ VR3-Pub - *It was easy to understand, and there is a logical flow. As I said, there is a standard in the construction, and it is logical across the sections.*
- ✓ VR4-Pri - *"I think it is going to be relevant for renegotiations."*
- ✓ VR5-Pri *"Yes, it is very applicable. It is well demonstrated, and it should be used in practice".*

The framework emphasises factors that can lead to renegotiations including remedial actions that can be taken to address variance in the project VfM criteria and performance indicators. Operations and liaison manager of one of the growing concession companies in the Northeast of England substantiate the achievement of VfM based on the payment mechanisms defined in the contract. According to the findings, the payment mechanisms are also used as the basis to measure project performance.

The validation participant corroborates this submission as follows: *"There are different types of indicators used to assess VfM for users, for instance, the A12 road DBFO uses the availability of road network, which measures VfM regarding the actual roads that are available to the users.*

So, the way they, i.e., the client ensures the achievement of VfM for the users is different from our contract." Hence, based on this comment and other numerous comments and suggestions of the validation participants, it became clear that there is a need to include contract mechanisms for payment in the framework as shown in Section 1. Moreover, the findings of the validation interviews also suggest the need for the stakeholders, i.e., both client and the SPV to agree and define the contract mechanisms for payment at the inception of the contract to enhance the achievement of VfM for both parties. Also, the validation participants confirm their respective agreement for the definition and inclusion of renegotiation measures at the beginning of the contract to guide renegotiation and change negotiation during the implementation of the contract.

The joint agreement by the primary stakeholders to the measures and contract mechanisms for payment will forestall the occurrence of disputes between the parties at renegotiation. Though the client usually defines the contract mechanisms for payment, there is also the need for the private partner (i.e., the SPV to agree its terms with the client before the commencement of the contract). The agreement of the terms of the contract mechanisms for payment by the stakeholders will also allow for ease and mutual adoption of the provisions of the contract during the implementation, especially at renegotiation. Summarily, the defined measures and payment mechanisms for VfM achievement can be adopted by the first renegotiating parties as stated in Sub-section 8.3.1 of this thesis. Furthermore, Section 1 of the framework incorporates the evaluation of appropriate VfM contract mechanisms for payment by both parties (i.e., client and SPV).

8.5.3 Applicability and Usefulness of the Framework

The validation interviews assess the applicability and usefulness of the framework for the evaluation of PFI (DBFO) road project renegotiation for VfM achievement. Some of the comments of the respondents regarding the applicability and use of the framework are enumerated below:

- ✓ VR1-Pri – *"Regarding DBFOs like ours that have been developed based on frozen standards where the SPVs are not allowed to make changes or modifications, I will say the framework is moderately applicable. However, in the most recent type of road DBFOs where the standards are not frozen (i.e., a contract where changes and modifications are allowed), the framework can be said to be applicable".*
- ✓ VR3-Pub - *"I will say the framework is useful. It indeed poses some right questions within the flow of the chart, which are pointers to what should be done during change negotiation. So, I think it is a useful tool in practice".*
- ✓ VR5-Pri – *"I will say it is moderately relevant and appropriate to concession company. The client will find it very suitable because it establishes the different part of their operations".*

Based on the comments from all the experts working in both the public and private sectors, the framework is both applicable and suitable for the evaluation of DBFO road project renegotiation for VfM achievement. Hence, it is useful in the assessment of renegotiation during project implementation for VfM achievement. The responses of the selected interviewees regarding Section B and Section C of the validation interview questions shown in Appendix 11 in Table 8.7.

Table 8.7: Validation Interview Results

S/N	Validation participants	Participant code	Framework awareness	Ease of understanding	Remedial actions coverage	Payment Mechanism Adoption	Mechanism for payment and VfM success	Framework applicability	Framework usefulness	Usefulness to stakeholder
1	**Practitioners (Study Participants)**									
		VR1-Pri	No = 0	High = 3	High = 3	Yes = 1	High = 3	Applicable = 3	Useful = 3	Client and SPV
		VR2-Pub	No = 0	High = 3	Very High = 4	Yes = 1	Very High = 4	Applicable = 3	Useful = 3	Client
		VR3-Pub	No = 0	High = 3	High = 3	Yes = 1	Very High = 4	Applicable = 3	Useful = 3	Client
		VR4-Pri	No = 0	High = 3	High = 3	Yes = 1	Very High = 4	Applicable = 3	Useful = 3	Client and SPV
Mean score			0.00	3.00	3.25	1.00	3.75	3.00	3.00	
2	**Practitioners (Non-study participants)**									
		VR5- Pri	No = 0	Very High = 4	-	-	-	Applicable = 3	Useful = 3	SPV and Users
		VR6-Pri	No = 0	High = 3	Moderately High = 2	Yes = 1	High = 3	Moderately Applicable = 2	Moderately Useful = 2	Client
		VR7-Pri	No = 0	High = 3	High = 3	Yes = 1	Very High = 4	Applicable = 3	Useful = 3	Client and SPV
Mean score			0.00	3.33	2.00	0.67	3.67	3.33	3.00	
Mean Score/ overall result			0.00	3.14	2.57	0.86	3.14	2.86	2.86	

Key: See List of abbreviations in the preliminaries section

A cursory view of the validation result reveals the mean values of each of the responses received and indicates that most of the validation participants agree regarding the applicability, relevance and usefulness of the proposed framework. Statistical methods were, however, employed to ascertain the level of agreement between the responses of the study participants and the non-study participants. Kruskal Wallis and Mann Whitney tests were used comparatively. The Kruskal-Wallis test is a non-parametric test, which does not assume that the data come from a normal distribution. The Mann–Whitney U-test (also known as the Mann–Whitney–Wilcoxon test, the Wilcoxon rank-sum test, or the Wilcoxon two-sample test) is limited to nominal variables with only two values; it is the non-parametric analogue to the two-sample t-test. Though the Mann-Whitney test uses a different test statistic (i.e., U instead of the H of the Kruskal–Wallis test), the P value is mathematically identical to that of a Kruskal–Wallis test. The assumption regarding the P value is that the values of Ucrit for $\alpha = 0.05$ (two-tailed) as stated in the Mann-Whitney Tables (McDonald, 2014). Hence, there is a significant difference between the two sample in a situation where the p-values are less than or equal to 0.05.

As shown in the Kruskal Wallis result illustrated in Table 8.8, all the p-values are more significant than 0.05, which indicates that there is no statistically significant difference between the responses received from the all the participants. Mann-Whitney test results shown in Table 8.3 means that all the p-values are higher than 0.05. The results also indicate that there is no statistically significant difference between the responses of the study participants and the non-study participants. The homogeneity and consistency of the result are, therefore, established since no statistical difference among the seven participants involved in the framework validation. The finding strengthens the external validity of the framework as explained in (Roe and Just, 2009). Hence, the conclusions drawn from the study through the developed framework can be generalised for PPP road projects application as substantiated by the positive comments of the participants, which is in Table 8.7. Summarily, the results of the Kruskal Wallis test for the differences between the framework participants and the Mann-Whitney test, which compares variance between two samples are in Table 8.8 and Table 8.9.

Table 8.8: Kruskal Wallis Test for Differences between the Framework Validation Participants

	Framework awareness	Ease of understanding	Remedial actions coverage	Payment Mechanism Adoption	Payment mechanism & VfM success	Framework applicability	Framework usefulness	Usefulness to stakeholders
Chi Square	0.000	6.000	6.000	6.000	6.000	6.000	6.000	0.000
Df	6	6	6	6	6	6	6	6
Asymp. Sig	1.000	.423	.423	.423	.423	.423	.423	1.000

Note: The grouping variable involves all the validation participants

Table 8.9: Mann Whitney Test for Differences Between Study Participants and Non-study Participants

	Framework awareness	Ease of understanding	Remedial actions coverage	Payment Mechanism Adoption	Payment mechanism & VfM success	Framework applicability	Framework usefulness	Usefulness to stakeholders
Mann-Whitney U	6.000	4.000	1.500	4.000	5.500	2.000	4.000	6.000
Wilcoxon W	12.000	14.000	7.500	10.000	11.500	12.000	10.000	12.000
Z	.000	-1.155	-1.755	-1.155	-.224	-.1.789	-1.155	.000
Asymp.Sig. (2-tailed)	1.000	.248	.079	.248	.823	.074	.248	1.000

Note: The grouping variable involves the comparison between the study participants and the non-study participants

8.6 SIGNIFICANCE OF THE VALUE FOR MONEY RENEGOTIATION FRAMEWORK

The framework developed is significant for application to the renegotiation of road concession projects. However, it can also be generalised for PPP road projects application. The VfM renegotiation framework proposes guidelines which can provide implication for policy and research significance in PPP. The importance of the framework is as follows:

- Modalities for the establishment of the factors leading to renegotiation of PPP road projects. There is an indication that there is a relationship between the reasons for requesting renegotiation and the VfM achieved. The framework seeks to define procedural steps to identify and ascertain what motivates or prompts the renegotiating parties to make renegotiation decisions. Hence, the framework incorporates the need to establish all the factors leading to renegotiation in a specific instance and presents the evaluation procedure. The framework also suggests a mode of assessment for road concession renegotiation regarding the ascertaining of the impact of renegotiation on VfM criteria including how to establish and define the renegotiation outcomes.
- The renegotiation outcomes could necessitate remedial actions that could correct deviation from the quantitative and qualitative indicators of VfM, which are indicators of project performance. Hence, the success of the road concession project regarding VfM achievement can be followed up during the implementation of the project.
- The measures that can prevent the non-achievement of VfM at the renegotiation of DBFO road projects need to be defined and established as an essential part of the contract at the formative stage for adoption in the event of renegotiation. The measures can ensure the achievement of VfM for the client.

- The adoption of all the identified sections of the framework can lead to the effective implementation of the road concession projects by the responsible renegotiation stakeholders. It is, however, important that appropriate considerations and measures are, mainly taken at the design and planning stage to ensure the achievement of VfM for the public sector during the technical implementation stage. The reason for this is because the principal factors leading to the renegotiation of road concession projects in the UK are categorised into technical factors. Measures are, therefore, needed at the design stage before renegotiation occurrences to ensure that there is the achievement of VfM for the public sector at the development stage.
- The VfM renegotiation framework is beneficial to both the public and private sectors as it clearly defines how to address ineffective and inefficient renegotiation observed in previous PPP road projects, which has resulted in adverse outcomes such as lengthy renegotiation with the resultant effect of weak quality, as well as overrunning concerning cost and time. The adoption of the developed VfM renegotiation framework will assist public agencies in employing proactive actions and measures for sustainable renegotiation in PPP road projects. The adoption of this framework by the intended stakeholders, (i.e., the public and private partners) will foster the achievement of value for money, something that has currently eluded PPP infrastructure renegotiations, especially in the water and transport sectors. The framework further serves to ensure that the public sector VfM objectives, users' needs and private investor's interest and motives are sustained and achieved.

8.7 SUMMARY OF THE CHAPTER

This chapter has succeeded in presenting the developed and validated VfM renegotiation framework for PPP road projects as established in Objective 6 of this research. The framework has made a significant contribution and has attempted to resolve the lingering problems of VfM achievement in PPP concessions, particularly at the renegotiation stage. The comments of the validation respondents are evidence of the relevance, applicability and usefulness of the framework in the evaluation of renegotiation for VfM achievement. Taking into consideration the dearth of enough literature and empirical findings of renegotiation in the UK, the framework is not only original, but it is also innovative. One important consideration, which flows through the framework and cuts across the templates established as Table 8.2, Table 8.3, Table 8.4, Table 8.5 and Table 8.6, is the inclusion of evaluation criteria for each section of the framework.

These afford the parties at renegotiation the opportunity to review and evaluate the respective parts for VfM achievement. Hence, the VfM renegotiation framework can serve as a benchmark for the evaluation of road concessions for the accomplishment of VfM.

The framework, therefore, shows the flow of evaluation of road concessions from the definition of contract mechanisms for payment and the establishment of measures to ensure the achievement of VfM. The implementation of necessary actions to remedy any observed deviation from the defined VfM objectives is a paramount consideration during the execution of road concessions. The prospect of an assessment of renegotiation for VfM achievement through workable parameters that foster the success of the VfM objectives of the respective stakeholders, especially the public sector's VfM goals. Conscientious use of the framework at renegotiation will serve as a guide to the primary stakeholders, (i.e., the public and private partners in the evaluation of PPP road projects renegotiation for VfM achievement).

CHAPTER 9 CONCLUSION AND RECOMMENDATIONS

9.1 INTRODUCTION

Renegotiation research in PPP infrastructure projects, primarily in the transport sector, is comprehensive and inexhaustible. The study has extensively addressed the principal issue surrounding renegotiation of PPP road projects, which is VfM. However, the resolution for the VfM problem during the renegotiation stage of PPP road projects is in the context of UK PFI (DBFO) road projects. There have been significant identifications of the factors leading to the renegotiation of PFI (DBFO) road projects. The impacts of the renegotiation on the VfM criteria have been outlined, highlighting several outcomes of the renegotiation. Remedial actions may be necessary to align the results of the renegotiation based on the requirements defined for VfM at the planning and contract formation stage. Specific statements regarding appropriate measures should be in the contract to ensure the achievement of VfM at renegotiation.

This chapter summarises the process of the research, the methodological approach taken and the main findings. Conclusions based on the principal findings and recommendations to ensure the achievement of VfM at the renegotiation of PPP road projects are enumerated. Suggestions, which include the need for the evaluation of other transport projects such as rail, sea and airport projects, with the aim of establishing their renegotiation experience and determining whether there is the achievement of VfM.

9.2 ACHIEVEMENT OF THE RESEARCH OBJECTIVES

The empirical research study, which on objectives 3, 4 and 5 of the study, established the VfM renegotiation framework, which is objective 6 of this research and forms a unique and original concept. The framework emanates from the findings of both the qualitative and quantitative research including the literature and combines theory with practice. The uniqueness of this framework is on the results of the individual research objectives identified in chapter 1. These findings are discussed in this section as follows:

9.2.1 Research Objective One – PPP Infrastructure Projects

The PPP projects delivery and the surrounding issues form the basis of this research, which elicits secondary sources of data through literature sources to evaluate PPP and identify the inherent gap in knowledge. This objective seeks, through the literature: *"to review PPP as a procurement method for the general delivery of public sector infrastructures including road projects."*

To foster efficiency and ensure VfM in the delivery of infrastructure projects, procuring authorities across the world are now adopting other procurement methods, such as PPP, for infrastructure projects delivery rather than the traditional procurement method; for example, the UK Government finance infrastructure projects, especially roads, in the model of PFI. Sustainability issues, a conflict between the private and public partners' objectives, long periods of reaching a contractual agreement, the stability of agreements, stakeholders' management, environmental constraints, along with political and economic changes including renegotiations are all challenges hindering the successful implementation of PPP (See section 2.10). Among these challenges, renegotiation stands out as impeding successful PPP implementation regarding VfM achieved for the stakeholders, particularly the procuring authority. This main deficiency and the resulting criticisms arising, as a result, reflect the lingering challenge to the attainment of VfM objectives for the public-sector client in infrastructure projects delivery, especially in the water and transport sectors of most countries.

In the transport sector, the literature findings reveal that road projects account for the highest number of renegotiations with evidence of significant overrunning costs. Over the years the renegotiation of road projects has become very worrisome, due to the substantial financial implications of the investments for both the private investor and governments initiating the infrastructure projects. The high capital intensity attributed to road concession projects makes the implementation not only critical but necessary, especially during renegotiation, which has been found to erode the VfM objectives of the public sector in the road sector.

Since the principal objective of a government during the initiation of a PPP project delivery is to ensure VfM for the public partner and satisfaction for the members of the public; it is necessary to address the VfM problem identified in PPP road projects, because of renegotiation, which has resulted in implementation issues and challenges. Although, the supporting literature indicates that the private concessionaire has, in most instances, achieved the VfM objective of maximum profits with money invested; there is still the need to develop modalities to address the problem of VfM achievement, especially for the public sector during the renegotiation of concession contracts.

This problem has been recognised as one of the most critical issues impeding successful VfM implementation, especially in water and transport sectors that are imperative and need expedient completion (Sarmento, 2014; Nikolaidis and Roumboutsos, 2013; Estache et al., 2009): this problem with PPP led to the second objective of the research.

9.2.2 Research Objective Two – Contract Renegotiation and Value for Money

The second objective, as discussed in chapter 3 of this thesis seeks to *"evaluate contract renegotiation and value for money criteria in the PPP environment, particularly in road projects."*

The chapter, through many reviews of the literature, discusses the concept of contract renegotiation and appraises renegotiation of PPP infrastructure projects regarding road projects. The research reveals that specific factors led to the renegotiation of PPP road projects. Some of the case studies respondents identify specific factors as the reasons why primary stakeholders renegotiate the concession road projects. These factors are found in the literature and grouped according to their respective stages of implementation. These phases range from the design and planning, technical, tendering and bidding, administrative and managerial and contractual stage amongst others. Renegotiation requests could be at the instance of the public client, private partner or both, depending on the situation and circumstances of the project. However, the operator or concessionaire initiates most renegotiations in road concession projects.

Fourteen criteria of VfM from the PPP literature as being potentially impacted by renegotiation, as discussed in chapter 4 of the thesis (See section 4.6). The findings of the case studies and the questionnaire corroborate the findings of the literature, which state that renegotiations have an impact on the fourteen main VfM criteria in road concession projects (See section 4.7.1 and sub-section 6.4.4). These impacts were identified to include the public-sector stakeholder's objectives regarding the VfM criteria of cost, duration, quality and performance and user's satisfaction. Renegotiation experiences discussed in the literature reveal that the outcomes of PPP renegotiation seem to be unfavourable to the public sector regarding VfM, including maximising the profit objective of the SPV. Chapter 4 critically reviews VfM in PPP environments, with specific reference to DBFO road project renegotiations in the UK. Consequently, this chapter highlights that VfM can be measured and assessed during the renegotiation stage through the criteria established in the contract, as outlined by the fourteen identified criteria of VfM. Thus, the findings based on objective 2 of chapter 1 establish that there exists a relationship between renegotiation and VfM in PPP infrastructure projects, including road projects (See section 1.4 of the thesis).

Having established that there exists a relationship between renegotiation and VfM, it is imperative that there is the need to conduct an extensive empirical study in the context of the UK PFI (DBFO) road projects. The reason for the conduct of the study is because of the observed gap in knowledge between renegotiation and VfM, as identified in the literature. Therefore, empirical data was collected in the UK PFI (DBFO) road projects to critically assess and evaluate renegotiations regarding the achievement of VfM for the public sector based on the fourteen criteria of VfM. The UK was chosen because of its long history of PPP adoption in the form of PFI for general infrastructure projects delivery including road projects and the few empirical studies that exist regarding PPP renegotiations, especially in road projects. Hence, chapters 2, 3 and 4 serves as the basis for the development of instruments for the empirical renegotiation studies in the UK.

9.2.3 Research Objective Three – Factors Leading to Renegotiation

The third objective of the research and the first objective, which elicits empirical results to address the research objectives at the advanced stage of the research involves:

"Investigating the incidence of renegotiations in PFI (DBFO) road projects to identify factors leading to renegotiation."

The first aspect of the study during the data collection stage is to evaluate and assess the factors leading to the renegotiations of road concession projects. The renegotiations are occurring in the case studies, as identified by most of the respondents, are considered minor. Only CS2 respondents (i.e., XY2 and XY3) discussed the occurrence of up to five instances of renegotiation, most of which have an impact on the contract. The renegotiations in this case study entail small improvements works. However, there is an instance of significant renegotiation. XY4 and XY8 indicate minor variations and changes, rather than changes that can lead to amendments to the contract. Although the findings suggest that the contracts, in most instances, do not allow for renegotiation of the contract; most of the case studies agreed on minor renegotiations and changes that are on some factors. An evaluation of the responses provided by the respondents regarding this objective indicates that there is an agreement regarding the factors leading to the renegotiation of road concessions. The highly critical factors and critical factors leading to renegotiations, from the results of the qualitative interviews and questionnaire survey responses, focuses on technical, contractual and environmental related factors (See section 7.4). Some of the factors in these categories are as shown in Table 9.1.

Table 9.1: Interviews and Questionnaires Results on Renegotiation Leading Factors

S/N	Qualitative Interview Survey		Quantitative Interview Survey	
	Factors Identified	**Rank**	**Critical Factors Identified**	**Rank**
1	Changes in standards of works	1	Change in the standards of works during the technical development	1
2	Changes in specifications	2	Specification changes [e.g. change in the standard of technical skills, change in the type of technology etc.]	2
3	Addition of road assets	2	Change in the scope of works during the technical development of project	2
4	Change in scope of works	4	Additional works during construction [e.g. requirement for extension or widening of the road network]	4
5	Response to provisions of the original contract	4	Additional works during operation & maintenance [e.g. removal and replacement of assets etc.]	5
6	Need to ensure a safer road for travelling public	6	Changes in infrastructure design, layout and programme during project execution	5
7	Changes in technology	6	Environmental impacts	6

Based on Table 9.1 above, the following deductions towards ascertaining the factors that can lead to renegotiation and the factors fostering the achievement of VfM at renegotiation:

1. Technical and contractual related factors are all associated with the construction and contract formation phase of the PFI (DBFO) road project implementation.

2. Renegotiations of road concession projects in the UK mostly occur during the implementation stage, especially during the construction, operation and maintenance stage (See Table 7.4).

3. The factors leading to renegotiation are the reasons necessitating renegotiation. However, there can be factors that are not very critical or essential to the stakeholder(s) initiating renegotiation.

4. The highly crucial factors are the principal reasons that necessitate renegotiations in the road concession projects. The findings, based on the extremely critical factors leading to renegotiations, reveal that there is a substantial achievement of the VfM objectives of both the public and private sector representatives. These suggests that renegotiations should be in a situation where one or more of these factors inform the primary stakeholder's renegotiation request. The reason for this suggestion is the possibility of achieving VfM based upon the very critical renegotiation leading factors.

5. The stakeholders should be wary to request renegotiation based on non-critical factors, this includes opportunistic bidding by the private concessionaire, bidding errors during procurement at the tendering and bidding stage and inadequate transparency in the discharge of managerial duties. These factors should not lead to renegotiation because of the tendency not to achieve VfM for the public sector.

Thus, the non-critical factors should be considered undesirable by the public sector procuring authority and should be avoided when discussing the available options towards reaching a renegotiation decision.

The five deductions outlined are from the findings of objective 3 and enumerate the essential elements that foster the understanding of the factors that can lead to the achievement of VfM at renegotiation. Some factors have the potential to drive the success of the public client regarding VfM during renegotiation. However, some factors do not encourage VfM success in PFI (DBFO) road projects.

9.2.4 Research Objective Four – Impacts of the Renegotiation

The fourth objective is *"to ascertain the impacts of the renegotiation of PFI (DBFO) road projects on the VfM criteria."*

Regarding this objective in the context of UK PFI (DBFO) road projects, the study provides an avenue to evaluate and assess renegotiation from the perspectives of the VfM criteria of time, costs, quality and users or taxpayer's satisfaction. The literature provides comprehensive information on these VfM criteria (See section 4.6). Thus, the impacts of renegotiation can be assessed based on these criteria established in the literature for VfM evaluation. The case studies findings show that the primary effects of the renegotiation are around construction cost, and concession duration, in their respective order of significance (See subsection 6.4.4). The cost of construction is measured based on performance as indicated in CS1. Hence, the price is a good indicator used in the measurement of the performance of a concession project and VfM. Similarly, the questionnaire findings show that the impacts of the renegotiation, according to their decreasing order of importance, are construction cost, project finance cost, operation and maintenance costs, user's satisfaction, private sector management expertise and skills, whole life cycle cost (WLCC), construction duration and cost of risk transferred. These impacts reveal that cost is mostly affected by renegotiation and suggest that cost is the primary criteria for measuring or evaluating the achievement of VfM in road concession projects.

Furthermore, the findings of the case studies and questionnaire vividly reveal that cost is the VfM criterion affected by renegotiation to a higher degree than other VfM standards. These suggest that costs criteria are a strong determinant and indicator of VfM achievement in PFI (DBFO) road projects. Several significant facts and deductions emerge from the findings relating to the impacts of renegotiation on road concession projects, these are:

1. The paramount measure of VfM for the stakeholders' centres on cost and covers construction cost, project finance cost; O&M cost, whole life cycle cost and the cost of risk. Stakeholders, therefore, mostly seeks to assess the impact of renegotiation on these criteria.

2. The amount of money expended by the client on the road concessions regarding payment through the payment mechanism is a strong determinant and indicator of whether VfM is achieved or not.

3. The construction duration is also a significant measure of VfM for the public sector, which may be impacted by any changes and additional works introduced at the technical stage of project implementation.

9.2.5 Research Objective Five– Outcomes of the Renegotiation

The fifth objective of this research study seeks *"to evaluate and assess the outcomes of the renegotiation of PFI (DBFO) road projects."*

An evaluation of the case studies and the questionnaire reveal the principal outcomes of the renegotiation, which can also be the implication of the renegotiation. The results obtained for each of the criteria used to assess VfM is distinct from the nature of the impacts, i.e., positivity, negativity and neutrality of the renegotiation factors. Hence, the outcomes identified by the respective interviews and questionnaire respondents are in Table 9.2.

Table 9.2: Interviews and Questionnaires Results on the Outcomes of the Renegotiation

S/N	Qualitative Interview Survey		Quantitative Interview Survey	
	Outcomes Identified	**Rank**	**Critical Outcomes Identified**	**Rank**
1	Contract cost remain the same	1	Increase & Neutral Users Satisfaction	1
2	Completion within contract duration	2	Quality and Performance	2
3	Quality and performance achieved	3	Construction Duration	3
4	Cost savings occasioned by assets removal	4	Project Finance Cost	3
5	Neutral (same) profit by concessionaire	4	Operation & Maintenance Cost	5
6	Timely completion of construction and on schedule	4	Cost of Risk Transferred	6
7	Good service delivery brings users complement	7	Construction Cost	7
8	Few complaints from users and members of the public	7	Concession duration	8
9	Increase in contract cost due to addition of assets	9	Whole Life Cost	9
10	Decrease in contract cost due to inclusion of new standards	9	Profitability of the road concession to the SPV	10

The results of the data collected reveal that contract cost and construction duration of the concession contract remain the same concerning other VfM criteria. However, there is evidence of the achievement of VfM regarding an increase in user's satisfaction and the quality and performance of the concession. The cases studies reveal that there is the completion of the projects within the contract duration, as shown in the 10th ranked outcome. Besides, the prominent result of the renegotiation, according to the findings of the questionnaire, is user's satisfaction; while the least listed result is the profitability of the road concession to the SPV. These questionnaire findings, which summarises the findings of the empirical data, indicate that there is evidence of VfM achievement for the public sector.

Though, the SPV achieve the VfM objectives; there is no evidence of unjustifiable benefits from the renegotiation, which detrimentally affect the public sector. Hence, the findings suggest that the renegotiation of the road concessions has not increased the profitability of the road PFI's in favour of the SPV.

These findings conclude that renegotiation does not necessarily have to benefit the concessionaire to the detriment of the public sector and the users as outlined in the literature (Sarmento, 2014; Baeza and Vassallo, 2010; Acerete et al., 2010). Furthermore, the outcomes of the road concession renegotiations as indicated in Table 9.2 suggest that renegotiation can be beneficial to the public sector and all the renegotiating parties regarding the achievement of VfM. Indeed, there can be the delivery of the respective VfM objectives outlined by the parties at inception, especially the VfM aim of the procuring agency, which is around satisfaction for the users and members of the public. These unique findings constitute one of the primary results of this study and are the foundations for the philosophy of this research.

9.2.6 The Developed and Validated Framework for VfM Renegotiation

This objective is the sixth and last objective of the research, which is *"to develop and validate a value for money renegotiation framework for the PFI (DBFO) road projects."*

The findings of the empirical objectives 3, 4 and 5 indicate that it is necessary and practicable to develop a framework, which will assist and aid VfM achievement in future renegotiations in PPP road projects. The findings from the VfM renegotiation framework developed are presented in logical sequence as shown in Figure 8.1, Table 8.2, Table 8.3, Table 8.4 Table 8.5 and Table 8.6 respectively, to demonstrate its applicability for adoption in road concessions. The framework developed has succeeded in establishing the principles of assessing renegotiations for VfM impacts. Other evaluation principles reflect modalities for the identification and assessment of the renegotiation leading factors, the outcomes of the renegotiation and the remedial actions that can be taken to address the result of the renegotiation, which could link to one another. These findings suggest that renegotiation factors, renegotiation impacts, and the renegotiation results are all essential in the evaluation of renegotiation for VfM achievement.

Remedial actions identified in the framework can serve to correct any observed deviations from the VfM objectives of both the public-sector client and the concessionaire towards achieving VfM in the project. Moreover, the stakeholders may take appropriate measures, from the list identified, to forestall non-achievement of VfM during the implementation of PPP road projects (See subsection 7.7 and subsection 8.3.1). The proposals could be agreed upon and incorporated into the contract agreement during the design and planning stage or at the inception of the contract.

The VfM renegotiation framework has, therefore, succeed in developing modalities for assessing and checking renegotiation before renegotiation and during renegotiation, to ensure that VfM is achieved for the stakeholders, as clearly identified Figure 8.1.

The initial framework developed was refined at the validation stage to incorporate into Section A the contract mechanisms for payment to either to the SPV or public client as necessary. The reason for the incorporation of these mechanisms is on the understanding that these mechanisms are usually defined by the client at the inception to ensure that there is the achievement of user's satisfaction on the road network. Also, the validation findings suggest that there is need to include the fundamental contract mechanisms that assure road users safety, lane availability, journey time reliability amongst others, which are usually factored into the contract by the client depending on the DBFO contract. Hence, the framework was refined and amended appropriately to reflect the need for both the public and private partners to establish and agree on the contract mechanisms that foster the achievement of VfM for users.

The VfM renegotiation framework, therefore, emerges through suggestions from experienced professionals, practitioners and prominent academics in the construction industry. The principles set out in the framework, if rigorously adopted, will enhance and ensure the achievement of VfM at the renegotiation of PPP road projects.

9.3 SUMMARY OF FINDINGS

There is the possibility of estimating of the success of renegotiation in PPP infrastructure projects, especially in road projects regarding the VfM achieved for the procuring entity and commensurate revenue generated by the concessionaire. The experience of renegotiation in other countries in Latin America including Portugal and Spain give credence that there are pieces of evidence of non-achievement of VfM for the public sector due to the impacts of renegotiation on several VfM criteria, particularly the cost criteria. Hence, there is the maximisation of profits by the concessionaire in PPP road projects in these countries, which hinders the achievement of VfM for the public sector procuring authority and consequently the users. The current school of thought in PPP infrastructure project procurements is the need to ensure that the subsisting challenge of achieving VfM for the procuring authority is resolved and addressed. The research has substantially addressed this current problem through the development of a VfM renegotiation framework that will guide the primary stakeholders to make informed decisions at the design and planning stage, construction stage, and operation and maintenance stage amongst other stages of PPP to deliver road projects that achieve VfM for the public sector.

During the development of the framework, the research evaluated road concessions by identifying and assessing the factors leading to renegotiation, the impacts of the renegotiation on VfM criteria's, outcomes of the renegotiation and measures to ensure the achievement of VfM for the public sector. The reason for this evaluation is to ensure that the renegotiation of PPP road projects achieve VfM for the public sector and enhance commensurate profits for the concessionaire without compromising quality, concession performance and stakeholder's satisfaction, amongst other VfM criteria. Solutions to address each of the research objectives, which fill the knowledge gaps in the literature. The solutions entail practical measures as well as remedial actions at the renegotiation stage of PPP road projects. Moreover, the case studies identify payment mechanisms that are used to ensure the achievement of VfM for the client and SPV. The findings of this study as reflected in the provisions of the developed framework for the evaluation of PPP road project renegotiation addresses the knowledge gap and research questions generated from the literature.

9.4 LIMITATIONS OF THE STUDY

The scope of the research is on PFI (DBFO) road projects in the UK. However, the conclusions emanating from the research objectives, as discussed in this chapter, are significant and robust enough for global PPP road project renegotiations to ensure the achievement of VfM for the stakeholders, especially the public client. The reason for this is that PFI is a form of PPP used in the UK as a model for delivering road projects. Although the study investigated PFI (DBFO) road projects in the UK, the VfM renegotiation framework developed applies to PPP road projects procured through any of the available models where the public and private partners are the first renegotiation stakeholders. Hence, this study is limited to PPP road project renegotiations regarding its implications on VfM. In addition to this primary limitation, other notable limitations include:

- ✓ The inputs of only public and private sector stakeholders involved in PFI (DBFO) road projects in the UK based on the understanding that renegotiations of PFI (DBFO) road projects are only within the purview of these stakeholders. Hence, there is a lack of the entire stakeholders involved in PFI DBFO road projects due to the sensitivity and peculiarities of the subject and research questions.
- ✓ The responses received are low because of the limited number of questionnaires administered on the targeted respondents.
- ✓ The geographical coverage of the research is limited to public and private sector stakeholders on PFI (DBFO) road projects in England, Scotland and Wales. Stakeholders of PFI (DBFO) road projects in Northern Ireland declined participation in the study due

to their busy schedule and workload. Hence, the study is limited to PFI road projects where the public and private sector stakeholders freely consent and indicates availability to participate in the study.

9.5 RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The overall success of any PPP road project should be viewed regarding the achievement of VfM for the users and taxpayers and should be the corporate objective of all the stakeholders at renegotiation. VfM objectives of the individual stakeholders should contribute to the collective aspirations of VfM achievement for the users of the road and more critical than the specific intentions of the renegotiating parties (i.e., the procuring authorities and the concessionaire). The achievement of individual VfM goals should not be detrimental to the collective objective of VfM achievement for the users and members of the public, which is the primary objective of the procuring authority. The VfM renegotiation framework can realise the performance of the primary goal for both the representatives of the public client and the private sector partners involved in the renegotiation process of PPP road projects. Irrespective of the criteria of the contract and the objectives of the renegotiating parties regarding VfM defined for implementation, the parties involved in the renegotiation must be determined to use the principles of the framework and cooperate as a team by creating a cordial and good working relationship to achieve VfM for all the stakeholders, especially the users. In addition to teamwork, synergy and warm relationships, stakeholders and future researchers of PPP road projects renegotiation will find the following recommendation and suggestions useful.

9.5.1 Recommendations for the Stakeholders

The public and private partners can achieve their respective VfM objectives, especially satisfaction to the users using the principles outlined in the sections of the proposed VfM renegotiation framework. There is the need for the public and private partners who will be the primary beneficiary to be proactively involved in the use of the framework from contract inception to handing over of the project residual value. The proactiveness of the stakeholders will ensure the achievement of optimum renegotiation result for all parties.

There is also the need for the client to ensure that there is flexibility incorporated into the agreement from contract inception regarding the contract mechanisms for payment as identified in the framework to allow either party to introduce proposals that can enhance the achievement of VfM at renegotiation or change negotiation.

9.5.2 Suggestions for Future Research

Despite the numerous remedial actions and measures identified in the framework, this study was considered critical towards its purpose of ensuring the achievement of VfM at the renegotiation of road concession projects, and there are still opportunities for research in many areas of PPP renegotiations. Further research suggestions in the following areas are:

- ✓ The evaluation and assessment of other projects, especially in the transport and water sectors where high incidences of renegotiations have occurred would be a good area requiring investigation.
- ✓ Many highly critical and critical factors leading to renegotiations are in this study. However, more studies that are empirical in other PPP infrastructure projects are needed to substantiate the findings of this study, and the conclusion that the extremely critical and critical factors are the desirable factors leading to VfM renegotiations and the non-critical ones are the driving factors of non-achievement of VfM at renegotiations.
- ✓ There is the need for studies in other areas of road concession projects, such as the role of stakeholders especially financiers, equity companies', sponsors and financial service providers at renegotiation. Other future research should aim to uncover the exact renegotiation timings and level of involvement of all the stakeholders at renegotiation.
- ✓ The data collected in this research has succeeded in gathering relevant information regarding road concession renegotiations in UK PFI (DBFO) road projects for significant and robust application to PPP road projects. However, other countries efficiency and effectiveness in PPP road project renegotiations should be evaluated and objectively compared with the UK experience. These would ascertain the reliability of the framework developed and enhanced the validity of the feedback received from the stakeholders and the validation report.

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APPENDICES

APPENDIX 1 CASE STUDY INTERVIEWS COVERING LETTER

21st January 2016.

Dear Participant,

Full Case studies Research: Integrated Value for Money Renegotiation for Public Private Partnership Road Projects

(A) Why have I been asked to take part in the study?

This letter is to formally invite you to take part in the research study towards the award of Ph.D. at the University of Central Lancashire. The reason for seeking your audience is by your position as an acknowledge stakeholder of Public-Private Partnership (PPP) road projects in the UK.

(B) What is the aim of the study?

The study aims to develop and validate a value for money (VfM) framework for renegotiation of PPP road projects. This will involve the evaluation and assessment of the impacts and implications of renegotiation on the value for money objectives of PPP road prod projects.

The pilot study will be carried out to achieve the following objectives:

- To investigate the incidence(s) of renegotiations in PPP road projects
- To identify factors leading to renegotiation of PPP (DBFO) road projects
- To assess implications of achievement of VfM because of renegotiation in PPP road projects
- To evaluate and assess the impact of renegotiation of PPP road projects on VfM
- To validate by expert interview VfM framework for renegotiation of PPP road projects

(C) What is the study timeline or programme?

The full case studies are expected to run for a maximum period of twelve (12) weeks for data collection on each of the identified objectives.

(D) Why have I been asked to participate and who are my co-participants?

You have been asked to participate because of your involvement in UK PPP road projects. Public agencies, private concessionaires and equity holders of DBFO road projects are your co-participants.

(E) Do I have to take part in the study?

We will appreciate your decision to take part in this study. Participation is voluntary, and you are free to withdraw from the study at any time before the processing and analysis of the data that will be collected. If you decide to take part in the survey, you will be given all the relevant information for necessary action.

(F) What will happen to me if I take part?

The study will involve the collection of data from you concerning the identified objectives through an interview, which will be digitally recorded following the receipts of your consent, or hand-written notes will be recorded.

(G) What are the possible benefits of taking part?

The study will provide appropriate renegotiation strategy, which will assist PPP road projects stakeholders in achieving their respective value for money objectives at the point of renegotiation. Headline results of the research findings are also available on request.

(H) What are the possible risks of taking part?

There are no known risks in the execution or involvement of participants in the study. The data collection will take place in the UK and within the work environment of all the participants and will not involve projects site visit.

(I) Will what I say in this study be kept confidential?

There will be confidentiality and strict privacy of data collected from the study. Personal data will not be used in the study and respondent details will be anonymised and unpublished. Also, I undertake and assure to the effect that all participants' information will be coded in such a way that the participants are not identifiable from any comments that will appear in my Ph.D. thesis.

(J) What should I do if I want to take part?

Please complete the attached consent form and return by e-mail or any other convenient mode.

(K) What will happen to the results of the research study?

The results of the study will be reported in the Ph.D. thesis at the University of Central Lancashire, and a substantial part of the thesis will be published in conference and journal proceedings.

(L) Who is organising and funding the research?

I am a self-funded Ph.D. student at the University of Central Lancashire, Preston, UK.

(M) Who has reviewed the study?

The supervisory team has reviewed the research, and the study has been approved by the University of Central Lancashire ethics committee. However, should you have any concerns requiring ethical clarification or have concerns in the future about the way the study has been conducted, please contact the University Officer for Ethics (email address - (OfficerforEthics@uclan.ac.uk).

(N) Any contact for further information.

However, for any other queries, please contact any member of the supervisory team stated below:

1. Prof. Akin Akintoye (aakintoye@uclan.ac.uk) - Director of Ph.D. Studies
2. Dr Champika Liyanage (clliyanage@uclan.ac.uk) -2nd Supervisor

Thank you for taking time to read the information sheet and many thanks in advance for freely consenting to participate in the study.

Yours Sincerely,

Ajibola Fatokun (aofatokun@uclan.ac.uk)

Postgraduate Research Student,

University of Central Lancashire,

Preston,

APPENDIX 2 CASE STUDIES GUIDE QUESTIONS

PREAMBLE

Purpose of the Interview

The purpose of the interview is to probe the following:

1. The implications of the achievement of VfM because of renegotiation in PPP road projects.

2. To identify solutions to problems of VfM achievement during the renegotiation of PPP (DBFO) road projects.

Target respondents

Public sector stakeholders

Private sector stakeholders

INTERVIEW GUIDE QUESTIONS

A. Respondent's Details:

1. Can I have your position on the project, please?
2. What sector are you, please?
3. What is your academic/professional background, please?
4. What is the location of this project?
5. Do you have an idea of the estimated cost of the project?
6. What is the current stage of the project?
7. How many years has the project been on and what is the contract duration?

B. Assessment of the Implications of the Achievement of Value for Money (VfM) As a Result of Renegotiation in Private Finance Initiative (PFI) Road Projects

8. What aspect of this project undergo renegotiation, please?
9. At what point in the life of the project does this renegotiation occur?
10. Why do you renegotiate this contract?
11. Who makes the renegotiation request in this project instance?
12. What are the results of the renegotiation, i.e., the outcomes of the renegotiation? For example, renegotiation result regarding cost, concession duration, quality, concessionaire's profits, risks, revenue generated including stakeholder's satisfaction etc.
13. Is there any difference between the VfM achieved at the point of renegotiation and the VfM defined for implementation?
14. Is there any evidence of achievement of VfM for your organisation on this project?
15. How would you describe stakeholders (i.e. public sector, SPV and users) satisfaction regarding VfM achieved on this project?

C. Assessment of guidelines and measures to ensure the achievement of value for money at renegotiation of PFI (DBFO) Road Projects

16. How do you define strategic VfM targets in PPP road project concession phases? Are there any targets set for VfM at the inception of the contract?
17. What are the VfM targets that are usually defined and documented in PFI (DBFO) road projects?
18. What are the primary procedures you take in measuring the success regarding VfM achievement?
19. Do you think it is necessary to define criteria for renegotiation at the inception of PPP contract?
20. What are the guidelines adopted for assessing PFI road projects renegotiation regarding VfM achievement?

21. Has the guideline helped in achieving VfM or otherwise on this project?
22. Please describe the criteria and modalities for the identification, measurement and recording of the VfM achieved at strategic renegotiation points during the PFI road projects renegotiation?
23. What method or technique do you adopt in the evaluation or calculation of VfM variance occasioned by PPP road project renegotiation?
24. What do you think could be the strategic actions that can be taken to address deviations from the VfM targets defined at inception and the VfM achieved at the end of the renegotiation process?
25. Any other recommendation for achieving VfM at the point of renegotiation in PFI road projects, please?
26. In terms of this project, so far, can you say the changes made have not affected the contract cost?
27. In the next few years do you see any difference or changes in the contract cost and does the contract makes provision for that.
28. When do you propose to complete this project?

APPENDIX 3 QUANTITATIVE RESEARCH SURVEY QUESTIONNAIRE

College of Science and Technology

School of Engineering

Preston

PR1 2HE, U.K.

Dear Respondent,

I am currently a Ph.D. student at the University of Central Lancashire. To complete my doctoral studies, I have chosen *"Integration of Value for Money into the Renegotiation of Private Finance Initiative (Design-Build-Finance-Operate) Road Projects in the U.K."* as my research topic. Renegotiation of road projects has been an important issue that has generated concerns in Public Private Partnership (PPP) projects over the last decades. The outcomes of the PPP road projects renegotiation instances have in most instances resulted in non-achievement of VfM for the public sector. Therefore, this doctoral research intends to contribute to knowledge through the inclusion of value for money considerations into the renegotiation of PPP road contracts.

If you could please spare some of your time to respond to these questions, I will much appreciate it. To assist you in completing the questionnaire, you may find the following **key definitions** helpful:

- Renegotiation is regarded as an incidence which necessitates the revision or amendment of the original contract (e.g. expected or unexpected change in project scope which may result in rebalancing the financial agreement)
- Value for money implies achieving excellent and satisfactory product or service costs and quality (or fitness for purpose) within the whole life of the contract (contract duration) to meet the requirements of members of the public.

Your responses will be in confidence, and respondents' information will be anonymised and used for this study and quotes in publications.

Thank you for taking your time to complete the survey.

Ajibola Fatokun

Doctoral Researcher

E-mail: aofatokun@uclan.ac.uk

PRIVATE FINANCE INITIATIVE (PFI) DESIGN-BUILD-FINANCE- OPERATE (DBFO) ROAD PROJECTS RENEGOTIATION STUDIES QUESTIONNAIRE

Note: Most PPP road projects in the UK are procured in the form of PFI on DBFO basis. Based on this, please reflect on a U.K. PFI (DBFO) road project that you have been involved as a stakeholder and provide your responses by ticking the appropriate box in each section.

Section A: Respondent's Information

1. What PPP stakeholder do you represent?
   [ ] Public Agency/Client Representative [ ] Public Company Contracting
   [ ] Private Company Consulting [ ] Private Company Contracting & Consulting
   [ ] Financier/Lender [ ] Other *(please specify)* _____
2. How many employees are in your organisation?
   [ ] Less than 10 [ ] Between 10 -50 [ ] Between 50-500 [ ] 500+

3. What is your current position?
   [ ] Managing Director/CEO [ ] General Manager [ ] Project Manager
   [ ] Contract Performance Manager [ ] Engineer [ ] Fund Manager
   [ ] Financier Representative [ ] Quantity Surveyor
   [ ] Purchasing Manager [ ] Others *(please specify)* _____

4. How many years of PFI (DBFO) road projects experience do you have in the construction industry?
   [ ]0-5 [ ]5-10 [ ]10-15 [ ]15-20 [ ]20+

Section B: Project Specific Renegotiation Characteristics

Please provide information with regards to characteristics of the renegotiation experienced on the PFI (DBFO) road projects renegotiation you have been involved in the UK

5. Renegotiation is an incidence, which necessitate the revision or amendment of the original contract. Based on the characteristics of 'renegotiation', can you think of a renegotiated PFI (DBFO) project that you were involved in? Yes [ ] No [ ]

6. If yes, what is the project (please specify, e.g. A19 Dishforth Road):
   ……
7. If the answer is No, please submit the questionnaire.

8. Regarding the project you mentioned in question (2) above, what kind of renegotiation did the project go through? Please tick all that apply.

- 8_1. Unexpected incidence which necessitate the revision or amendment [ ]
- 8_2. Expected changes which necessitate the amendment of the original contract [ ]
- 8_3. Renegotiation, which occurs during the period of implementation of the contract as stated by a contractual clause. [ ]
- 8_4. Renegotiation, which takes place at the expiration of the contract when the parties are free from all contractual obligations [ ]
- 8_5. Renegotiation, which was undertaken in apparent violation of the contract or in the absence of a specific clause authorizing a renegotiation. [ ]
- 8_6. Any others (please specify)
  ……

Section C: Factors Leading to PFI (DBFO) Road Projects Renegotiation

9. It has been established that several factors lead to PFI (DBFO) road projects renegotiation. To what extent do you agree that the following factors might lead to PFI (DBFO) road projects renegotiation?

Strongly Agree (5) Agree (4)Indifferent (3)Disagree (2)Strongly Disagree (1)

Factors leading to Renegotiation	**5**	**4**	**3**	**2**	**1**
Additional Works					
9_1. During construction [e.g. requirement for extension or widening of the road network]					
9_2. During operation & maintenance [e.g. removal and replacement of assets (i.e. CCTV, speed camera, etc.)]					
Design Factors					
9_3. Inaccurate estimation of the traffic level					
9_ 4Inaccurate or defective project specification					
9_5. Inaccurate estimation of capital cost					
9_6. Poorly written contract [e.g. ambiguity of terms and contract details]					
Tendering and Bidding Factors					
9_7. Inadequate feasibility studies and other ex-ante pre-tendering analysis					
9_8. Erroneous change in the basis for tender					
9_9 Change in pricing and service					
9_10. Bidding error during procurement e.g. poor evaluation of inflated or aggressive bid					
9_11. Opportunistic bidding [e.g. bid submission with the intent to increase prices at renegotiation]					
Technical Factors					
9_12. Change in the scope of works during the technical development of project					
9_13. Change in the standards of works during the technical development of project					
9_14. Specification changes [e.g. change in the standard of technical skills, change in the type of technology such as IT specifications, changes in road network components and materials, etc.]					
9_15. Changes in infrastructure design, layout and programme during project execution					
Economic Factors					
9_16. Changes in economic policy by government [e.g. high or incremental changes to corporate tax and levies, currency devaluation etc.]					

9_17. Changes in general price level and transaction cost due to inflation [external macroeconomic shock i.e. materials, workmanship, toll charges etc.]					
Factors leading to Renegotiation(continued)	**5**	**4**	**3**	**2**	**1**
Contractual Factors					
9_18. Defective contract awards criteria or incorrect contractual assumptions					
9_19. Inadequate contract management expertise or knowledge					
9_20. Ineffectiveness and inefficiency of contract enforcement					
9_21. Time overruns for bidding and contract negotiation					
Administrative and Managerial Factors					
9_22. Managerial initiative and action to keep up with current contract standards					
9_23. Management incompetency [e.g. administrative delays during project execution]					
9_24. Inadequate transparency in the discharge of managerial duties, etc.					
Regulatory or Legal Factors					
9_25. Ineffective governance and regulation of the renegotiation process necessitating specific statutory changes to the contract					
9_26. Weak legal environment [i.e. in terms of litigation effectiveness]					
Political Factors					
9_27. Political instability occasioned by change in government or change in government priorities, awarding contract shortly before or after elections, overriding interest of major political constituency, etc.]					
9_28. Political instability evidenced in contract award shortly before or after elections					
9_29. The need to respect and adopt the overriding interest of major political constituency in the parliament					

9_30. Corruption at governance level evidenced in misappropriation of funds.					
9_31. Corruption at governance level e.g. awarding contract because of the nationality or affiliation of the concessionaire					
Environmental Factors					
9_32. Environmental impacts					
9_33. Archaeological constraints					
Social Factors					
9_34. Social acceptability of user charges by the members of the public					
9_35. Corporate social responsibility considerations.					
9_36. Opposition to continuation of the project by the members of the public					
Other					
9_37. Mismatch between the public and private partners objectives [e.g. in terms of profit sharing]					
Others (please specify) _____					
Other *(please specify)* _____					

Section D: Impacts of the Renegotiation of PFI (DBFO) Road Projects on Value for Money (VfM) Criteria

1. PFI (DBFO) road projects renegotiation has been found to impact value for money criteria defined into the contract. To what extent do you agree that PFI (DBFO) road project renegotiation impact the following value for money criteria defined into the contract.

Strongly Agree (5) Agree (4) Indifferent (3)Disagree (2)Strongly Disagree (1)

Impacts of renegotiation on VfM Criteria	**5**	**4**	**3**	**2**	**1**
Cost Impacts:					
10_1. Construction cost					
10_2. Operation & Maintenance (O& M) costs					

10_3. Project finance cost					
10_4. Cost of risks transferred					
10_5. Whole life cost of the contract					
Other Impacts:					
10_6. Concessionaires profits					
10_7. Construction duration					
10_8. Concession duration					
10_9. Quality of service delivery					
10_10. Users satisfaction					
10_11. Innovation of bidders in the use of output specification					
10_12. Competition that provides fair value of the project					
10_13. Performance based payment mechanism					
10_14. Private sector management expertise and skills					

Section E: Assessment of the Outcome of the Renegotiation of the PFI (DBFO) Road Projects

There are several outcomes of PPP road projects renegotiation. Please tick only one appropriate box (□) to show the identified outcome of the renegotiation of PFI (DBFO) road project you have been involved.

11. Outcome with respect to Construction Cost

[ ] Upward review of the cost of construction
[ ] Downward review of the cost of construction
[ ] No action required due to the cost neutrality condition included in the contract

12. Outcome with respect to Construction Duration

[ ] Extension of the construction duration of the road concession
[ ] Reduction of the construction duration of the road concession
[ ] No action taken because of completion within the specified timescale

13. Outcome with respect to Operation and Maintenance Cost

[ ] Upward review of the operation and maintenance costs
[ ] Downward review of the operation and maintenance costs
[] No action required due to the cost neutrality condition included in the contract

14. Outcome with respect to Project Finance Cost

[ ] Upward review of the cost of project finance
[ ] Downward review of the cost of project finance
[ ] No action required due to the cost neutrality condition included in the contract.

15. Outcome with respect to Cost of Risk Transferred

[ ] Upward review of the cost of risk associated with the project
[ ] Downward review of the cost of risk associated with the project
[ ] Neutral cost of risk included in the contract at the inception resulted to no difference in cost of risk

16. Outcome with respect to User Satisfaction

[ ] Increase in user satisfaction[ ] Neutral in user satisfaction
[ ] Decrease in user satisfaction

17. Profitability of the Road Concession to the SPV

[ ] Increase in the profit of the SPV [ ] Neutral profit earned by the SPV
[ ] Reduction in the profit of the SPV

18. Government Payment to the SPV

[ ] Government direct financial compensation to the SPV (e.g. direct financial reimbursement)
[ ] Government subsidies to the SPV
[ ] Bonus points issued to the SPV as a penalty
[ ] Redefining of the investment plans by the SPV
[ ] Financial rescue of the project by government
[ ] Upward adjustments on the annual fee paid by the operator to the government
[ ] No adjustments in the annual fee paid by the operator to the government
[ ] Downward adjustments on the annual fee paid by the operator to the government

19. Quality and Performance

[ ] Increased quality and performance standards of outputs
[ ] Neutral quality and performance standards of outputs
[ ] Decreased quality and performance standards of outputs

20. Whole Life Cost

[ ] Increased whole life cost of the concession contract
[ ] Neutral whole life cost of the concession contract
[ ] Decreased whole life cost of the concession contract

21. Concession Duration

[ ] Extension of the concession duration of the road concession
[ ] Reduction of the concession duration of the road concession
[ ] No action taken because of completion of the concession contract within the defined time

22. Innovation through the Use of Output Specification

[ ] Enhances innovation of bidders as a result of use of output specification
[ ] Use of output specification does not foster innovation or makes any significant difference
[ ] Reduction of the concession duration of the road concession
[ ] No evidence of the adoption of output specification and consequently no record of innovation.

23. Fair Value of the Project Due to Competition

[ ] Competition among bidders affords the attainment of a fair value for the public sector on the project
[ ] Competition among bidders does not result into a fair value for the public sector on the project
[ ] No competition on the project at renegotiation or variation results in the achievement of a fair value for the public sector
[ ] No competition on the project at renegotiation or variation results in no evidence of the achievement of a fair value for the public sector on the project

24. Performance Based Payment Mechanism

[ ] Payment is made based on the performance of the output and ensures value for money

[ ] Payment based on performance measurement makes no difference in the value for money achieved for the public sector on the project
[ ] No performance based payment mechanism in place on the project prevents evaluation of value for money achieved

25. Private Sector Management Expertise and Skills

[ ] Evidence of improvement in the management expertise and skills of the private sector
[ ] Management expertise and skills of the private sector remains neutral or the same
[ ] No improvement in the management expertise and skills of the private sector

26. Other Outcomes

[ ] Revised service delivery modalities
[ ] Raises questions about the credibility of the renegotiation process to deliver value for money for the public sector

Section F: Value for Money (VfM) in PPP Road Project Renegotiation

27. To what extent will the following measures be helpful to achieve value for money successfully in PPP road project renegotiations?

Strongly Agree (5)Agree (4)Indifferent (3)Disagree (2)Strongly Disagree (1)

Measures to ensure VfM success	**5**	**4**	**3**	**2**	**1**
Design and Planning Solution					
27_1. Define and establish a set of criteria and modalities for the identification, measurement and recording of the VfM achieved at strategic renegotiation points during the PFI road projects renegotiation					
27_2. Include in the contract agreement a contract award criteria which increase renegotiation request costs to the SPV's and also make exit from the contract expensive					
27_3. Clearly state in the contract that renegotiation must be based on VfM					
27_4. Ensure accurate estimation of requirements [e.g. materials cost, traffic level, finance cost, cost of risks and capital costs, etc.]					
27_5. Define performance indicators at the contract formation stage to ensure that more focus is placed on the delivery of the project in reference to these indicators					
27_6. Develop a clear, concise and properly written contract [e.g. specification of standards of materials, components and workmanship]					

27_7. Establish performance standards for SPVs at contract inception as a requirement for initiating renegotiation request payment					
27_8. Include a freeze period for renegotiations [e.g. 2-3 years after contract award through the placement of embargo on materials & work standards, etc.]					
27_9. Establish contract review processes and requirements with the aim of affecting defined or allowable changes to the contract					
27_10. Include hand-back requirements by the public sector [i.e. salvage value/depreciation level allowed at delivery or handover]					
27_11. Include project plan reviews [e.g. every 3 years to monitor the performance of the project and particularly of VfM]					
27_12. Fix penalty points for non-performance with applicable limits to SPVs before contract takeover by the client					
27_13. Establish outright contract takeover by the client due to non-performance of the SPV's					
27_14. Establish guidelines for levels of compensation applicable at strategic renegotiation points during project implementation					
27_15. Clarify key contractual clauses and key biding documents at contract inception					
27_16. Establish greater role of the PPP unit and regulatory agency					
27_17. Include a renegotiation clause in the contract agreement to foster financial equilibrium					
27_18. Establish a clear platform showing the process and procedure for renegotiation at the inception of the contract					
27_19. Stipulate the renegotiation approach, criteria and process prior to contract formation					
Tendering and Bidding Solution					
27_20. Define adequate and strict criteria for contract award to discourage opportunistic and aggressive bidding					

27_21. Cancel PPP road concessions mainly characterised by aggressive and opportunistic bids					
27_22. Control aggressive bids by inclusion of larger performance bonds in the contract					
27_23. Establish in the contract the right to evaluate and reject aggressive and reckless bids including submission of financial models for those bids or additional guarantees/financial bonds					
27_24. Establish modalities for the submission of financial models required for evaluating aggressive bids or additional guarantees/financial bonds					
27_25. Request a mandatory bidding process for additional works or infrastructures including interest rate for PPP financing					
Technical Solution					
27_26. Develop an effective parameter or trust process during technical implementation that allows both parties to understand the impact of any renegotiation on the project objectives					
27_27. Outright contract takeover by the client due to non-performance of the SPV's					
27_28. Teamwork should be intensified throughout the management of the project					
27_29. Ensure a proactive, collaborative and analytical approach in the making and management of the contract to foster friendliness between and among the partners					
27_30. Establish the renegotiation reasons during the project implementation, to assist in ascertaining the impact of the influence factors or reasons on VfM					
27_31. Prepare for contingent financing over time and throughout the implementation process as a result of viability gap funding					

Regulatory Solution					
27_32. Provide a statement in the PPP regulation establishing the inalterability of the contract risk matrix					
27_33. Establish clear jurisdiction at high level over decision to renegotiate the contract					
Administrative and Managerial Solution					
27_34. Ensure transparency of the renegotiation process					
27_35. Proper constitution of qualified and knowledgeable panel of expert to manage aggressive bids, renegotiation request and conflicts					
27_36. Establish a reputation of less or non-disposal to renegotiation					
Political Solution					
27_37. Implement a transparent framework through increase of political costs to accept renegotiation demands					
Risk Solution					
27_38. Ensure that the contract risk matrix includes detailed risks identification and allocation					
27_39. Establish in the contract that the modification of the contract, as a result of renegotiation, must not alter the VfM described or the risk allocation					
27_40. Establish that the modification of the contract must ensure zero net present value (NPV) and must preserve VfM defined at contract formation.					
27_41. Impose on the SPV's appropriate level of performance bonds [e.g. between 10-25% of the total PFI road project investment]					
Economic Solution					
27_42. Provide allowance for extension of concession contract in austere and adverse economic situations					

APPENDIX 4 DETAILED QUESTIONNAIRE DATA ANALYSIS RESULTS

RESPONDENTS INFORMATION

1. What PPP stakeholder do you represent?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	28.0	30.4	30.4
	2	2	8.0	8.7	39.1
	3	1	4.0	4.3	43.5
	4	13	52.0	56.5	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

2. How many employees are in your organisation?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	16.0	17.4	17.4
	2	3	12.0	13.0	30.4
	3	9	36.0	39.1	69.6
	4	7	28.0	30.4	100.0
	Total	23	92.0	100.0	
Missing	System	2	8.0		
Total		25	100.0		

3. What is your current position?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	4.0	4.5	4.5
	2	1	4.0	4.5	9.1
	3	9	36.0	40.9	50.0
	4	4	16.0	18.2	68.2
	5	4	16.0	18.2	86.4
	8	2	8.0	9.1	95.5
	10	1	4.0	4.5	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

4. How many years of PFI (DBFO) road projects experience do you have in the construction industry?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	2	8.0	11.1	11.1
	0	5	20.0	27.8	38.9
	0	5	20.0	27.8	66.7
	0	6	24.0	33.3	100.0
	Total	18	72.0	100.0	
Missing	System	7	28.0		
Total		25	100.0		

RENEGOTIATION CHARACTERISTICS

Q5

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	9	36.0	40.9	40.9
	1	13	52.0	59.1	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q6

		Frequency	Percent
Missing	System	13	100.0

Q7

		Frequency	Percent
Missing	System	13	100.0

Q8_1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	4	30.8	30.8	30.8
	1	9	69.2	69.2	100.0
	Total	13	100.0	100.0	

FACTORS LEADING TO RENEGOTIATION

Descriptive Statistics

	N	Mean
9.13. Change in the standards of works during the technical development of project	22	4.14
9.14. Specification changes [e.g. change in the standard of technical skills, change in the type of technology such as IT specifications, changes in road network components and materials, etc.]	22	4.05
9.12. Change in the scope of works during the technical development of project	22	4.05
9.1. During construction [e.g. requirement for extension or widening of the road network	22	3.73
9.2. During operation & maintenance [e.g. removal and replacement of assets (i.e. CCTV, speed camera, etc.)	22	3.68
9.15. Changes in infrastructure design, layout and programme during project execution	22	3.68
9.32. Environmental impacts	22	3.27
9.22. Managerial initiative and action to keep up with current contract standards	22	2.95
9.9. Change in pricing and service	21	2.95
9.34. Social acceptability of user charges by the members of the public	22	2.73
9.4. Inaccurate or defective project specification	22	2.73
9.33. Archaeological constraints	21	2.71
9.17. Changes in general price level and transaction cost due to inflation [external macroeconomic shock i.e. materials, workmanship, toll charges etc.]	22	2.68
9.36. Opposition to continuation of the project by the members of the public	22	2.59
9.3. Inaccurate estimation of the traffic level	22	2.50
9.6. Poorly written contract [e.g. ambiguity of terms and contract details]	22	2.45
9.21. Time overruns for bidding and contract negotiation	22	2.41
9.27. Political instability occasioned by change in government or change in government priorities, awarding contract shortly before or after elections, overriding interest of major political constituency, etc.]	22	2.36
9.35. Corporate social responsibility considerations	22	2.36
9.8. Erroneous change in the basis for tender	22	2.32
9.5. Inaccurate estimation of capital cost	22	2.32
9.28. Political instability evidenced in contract award shortly before or after elections	22	2.32
9.16. Changes in economic policy by government [e.g. high or incremental changes to corporate tax and levies, currency devaluation etc.]	22	2.32
9.37. Mismatch between the public and private partners objectives [e.g. in terms of profit sharing]	22	2.27
9.19. Inadequate contract management expertise or knowledge	22	2.23
9.23. Management incompetence [e.g. administrative delays during project execution]	22	2.18
9.29. The need to respect and adopt the overriding interest of major political constituency in the parliament	22	2.18
9.18. Defective contract awards criteria or incorrect contractual assumptions	22	2.14
9.25. Ineffective governance and regulation of the renegotiation process necessitating specific statutory changes to the contract	22	2.14
9.7. Inadequate feasibility studies and other ex-ante pre-tendering analysis	22	2.14
9.31. Corruption at governance level e.g. awarding contract because of the nationality or affiliation of the concessionaire	22	2.14
9.30. Corruption at governance level evidenced in misappropriation of funds.	21	2.10
9.20. Ineffectiveness and inefficiency of contract enforcement	21	2.05
9.26. Weak legal environment [i.e. in terms of litigation effectiveness]	22	2.00
9.24. Inadequate transparency in the discharge of managerial duties, etc.	21	1.81
9.10. Bidding error during procurement e.g. poor evaluation of inflated or aggressive bid	22	1.77
9.11. Opportunistic bidding [e.g. bid submission with the intent to increase prices at renegotiation]	22	1.77
Valid N (listwise)	17	

IMPACTS OF THE RENEGOTIATION ON VFM CRITERIA

Descriptive Statistics

	N	Mean
10.1. Construction cost	21	3.67
10.3. Project finance cost	21	3.62
10.2. Operation & Maintenance (O&M) costs	21	3.48
10.10. Users satisfaction	22	3.45
10.14. Private sector management expertise and skills	22	3.18
10.7. Construction duration	22	3.14
10.5. Whole life cost of the contract	22	3.14
10.4. Cost of risks transferred	22	3.09
10.9. Quality of service delivery	22	2.95
10.12. Competition that provides fair value of the project	21	2.95
10.13. Performance based payment mechanism	22	2.91
10.8. Concession duration	22	2.77
10.11. Innovation of bidders in the use of output specification	22	2.77
10.6. Concessionaires profits	22	2.73
Valid N (listwise)	19	

OUTCOMES OF RENEGOTIATION

Q11_1 UR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	14	56.0	63.6	63.6
	1	8	32.0	36.4	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q11_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	18	72.0	85.7	85.7
	1	3	12.0	14.3	100.0
	Total	21	84.0	100.0	
Missing	System	4	16.0		
Total		25	100.0		

Q11_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	11	44.0	50.0	50.0
	1	11	44.0	50.0	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q12_1UR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	48.0	57.1	57.1
	1	9	36.0	42.9	100.0
	Total	21	84.0	100.0	
Missing	System	4	16.0		
Total		25	100.0		

Q12_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	80.0	90.9	90.9
	1	2	8.0	9.1	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q12_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	48.0	54.5	54.5
	1	10	40.0	45.5	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q13_1UR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	10	40.0	45.5	45.5
	1	12	48.0	54.5	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q13_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	76.0	86.4	86.4
	1	3	12.0	13.6	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q13_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	15	60.0	68.2	68.2
	1	7	28.0	31.8	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q14_1UR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	11	44.0	50.0	50.0
	1	11	44.0	50.0	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q14_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	84.0	95.5	95.5
	1	1	4.0	4.5	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q14_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	48.0	54.5	54.5
	1	10	40.0	45.5	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q15_1UR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	48.0	54.5	54.5
	1	10	40.0	45.5	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q15_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	80.0	90.9	90.9
	1	2	8.0	9.1	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q15_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	13	52.0	59.1	59.1
	1	9	36.0	40.9	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q16_1UR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	6	24.0	27.3	27.3
	1	16	64.0	72.7	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q16_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	22	88.0	100.0	100.0
Missing	System	3	12.0		
Total		25	100.0		

Q16_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	16	64.0	72.7	72.7
	1	6	24.0	27.3	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q17_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	10	40.0	45.5	45.5
	1	12	48.0	54.5	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q17_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	19	76.0	86.4	86.4
	1	3	12.0	13.6	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q19_1UR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	6	24.0	27.3	27.3
	1	16	64.0	72.7	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q19_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	17	68.0	77.3	77.3
	1	5	20.0	22.7	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q19_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	21	84.0	95.5	95.5
	1	1	4.0	4.5	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q20_1UR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	12	48.0	60.0	60.0
	1	8	32.0	40.0	100.0
	Total	20	80.0	100.0	
Missing	System	5	20.0		
Total		25	100.0		

Q20_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	13	52.0	65.0	65.0
	1	7	28.0	35.0	100.0
	Total	20	80.0	100.0	
Missing	System	5	20.0		
Total		25	100.0		

Q20_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	15	60.0	75.0	75.0
	1	5	20.0	25.0	100.0
	Total	20	80.0	100.0	
Missing	System	5	20.0		
Total		25	100.0		

Q21_1UR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	17	68.0	77.3	77.3
	1	5	20.0	22.7	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q21_2DR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	20	80.0	90.9	90.9
	1	2	8.0	9.1	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

Q21_3NA

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	7	28.0	31.8	31.8
	1	15	60.0	68.2	100.0
	Total	22	88.0	100.0	
Missing	System	3	12.0		
Total		25	100.0		

MEASURES

Descriptive Statistics

	N	Mean
27.6. Develop a clear, concise and properly written contract [e.g. specification of standards of materials, components and workmanship]	22	4.27
27.1. Define and establish a set of criteria and modalities for the identification, measurement and recording of the VfM achieved at strategic renegotiation points during the PFI road projects renegotiation	22	4.23
27.4. Ensure accurate estimation of requirements [e.g. materials cost, traffic level, finance cost, cost of risks and capital costs, etc.]	22	4.18
27.3. Clearly, state in the contract that renegotiation must be based on VfM	22	4.18
27.5. Define performance indicators at the contract formation stage to ensure that more focus is placed on the delivery of the project with reference to these indicators	22	4.09
27.7. Establish performance standards for SPVs at contract inception as a requirement for initiating renegotiation request payment	22	4.00
27.18. Establish a clear platform showing the process and procedure for renegotiation at the inception of the contract	22	3.86
27.12. Fix penalty points for non-performance with applicable limits to SPVs before contract takeover by the client	22	3.86
27.28. Teamwork should be intensified throughout the management of the project	22	3.86
27.15. Clarify key contractual clauses and key contract documents at the inception of the contract	22	3.82
27.21. Cancel PPP road concessions mainly characterised by aggressive and opportunistic bids	22	3.77
27.26. Develop an effective parameter or trust process during technical implementation that allows both parties to understand the impact of any renegotiation on the project objectives	22	3.77
27.19. Stipulate the renegotiation approach, criteria and process prior to contract formation	22	3.77

27.23. Establish in the contract the right to evaluate and reject aggressive and reckless bids including submission of financial models for those bids or additional guarantees/financial bonds	22	3.73
27.20. Define adequate and strict criteria for contract award to discourage opportunistic and aggressive bidding	22	3.73
27.9. Establish contract review processes and requirements with the aim of affecting defined or allowable changes to the contract	22	3.73
27.2. Include in the contract agreement a contract award criterion which increase renegotiation request costs to the SPV's and make exit from the contract expensive	22	3.68
27.13. Establish outright contract takeover by the client due to non-performance of the SPV's	22	3.64
27.35. Proper constitution of qualified and knowledgeable panel of expert to manage aggressive bids, renegotiation request and conflicts	22	3.59
27.17. Include a renegotiation clause in the contract agreement to foster financial equilibrium	21	3.57
27.40. Establish that the modification of the contract must ensure zero net present value (NPV) and must preserve VfM defined at contract formation.	22	3.55
27.39. Establish in the contract that the modification of the contract, because of renegotiation, must not alter the VfM described or the risk allocation	22	3.55
27.30. Establish the renegotiation reasons during the project implementation, to assist in ascertaining the impact of the influence factors or reasons on VfM	22	3.55
27.24. Establish modalities for the submission of financial models required for evaluating aggressive bids or additional guarantees/financial bonds	22	3.50
27.10. Include hand-back requirements by the public sector [i.e. salvage value/depreciation level allowed at delivery or handover]	22	3.50
27.33. Establish clear jurisdiction at high level over decision to renegotiate the contract	22	3.50
27.22. Control aggressive bids by inclusion of larger performance bonds in the contract	22	3.45
27.11. Include project plan reviews [e.g. every 3 years to monitor the performance of the project and particularly of VfM]	22	3.45
27.34. Ensure transparency of the renegotiation process	22	3.41
27.14. Establish guidelines for levels of compensation applicable at strategic renegotiation points during project implementation	22	3.41
27.25. Request a mandatory bidding process for additional works or infrastructures including interest rate for PPP financing	22	3.36
27.31. Prepare for contingent financing over time and throughout the implementation process as a result of viability gap funding	22	3.27
27.27. Outright contract takeover by the client due to non-performance of the SPV's	22	3.27
27.38. Ensure that the contract risk matrix includes detailed risks identification and allocation	21	3.24
27.16. Establish greater role of the PPP unit and regulatory agency	22	3.00
27.8. Include a freeze period for renegotiations [e.g. 2-3 years after contract award through the placement of embargo on materials & work standards, etc.]	22	3.00
27.41. Impose on the SPV's appropriate level of performance bonds [e.g. between 10-25% of the total PFI road project investment]	22	3.00
27.37. Implement a transparent framework through increase of political costs to accept renegotiation demands	22	2.95
27.42. Provide allowance for extension of concession contract in austere and adverse economic situations	22	2.91
27.36. Establish a reputation of less or non-disposal to renegotiation	22	2.82
27.32. Provide a statement in the PPP regulation establishing the inalterability of the contract risk matrix	20	2.75
V1	0	
Valid N (listwise)	0	

Reliability Test- Factors leading to Renegotiation

Reliability Statistics

Cronbach's Alpha	N of Items
.959	37

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		341.975	16	21.373		
Within People	Between Items	290.016	36	8.056	9.302	.000
	Residual	498.849	576	.866		
	Total	788.865	612	1.289		
Total		1130.839	628	1.801		

Grand Mean = 2.60

Reliability Test- Impacts of the Renegotiation on VfM Criteria

Reliability Statistics

Cronbach's Alpha	N of Items
.964	14

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		373.985	18	20.777		
Within People	Between Items	29.417	13	2.263	3.039	.000
	Residual	174.226	234	.745		
	Total	203.643	247	.824		
Total		577.628	265	2.180		

Grand Mean = 3.21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	41.05	250.497	.851	.960
Q2	41.42	260.591	.612	.965
Q3	41.26	247.649	.894	.959
Q4	41.68	258.117	.761	.962
Q5	41.58	253.146	.769	.962
Q6	42.00	250.444	.790	.962
Q7	41.58	244.035	.865	.960
Q8	42.16	247.585	.905	.959
Q9	41.79	239.953	.914	.959
Q10	41.26	262.982	.561	.966
Q11	42.11	249.655	.862	.960
Q12	42.05	250.608	.823	.961
Q13	41.89	251.877	.800	.961
Q14	41.79	253.842	.735	.963

Reliability Test- Preventive Measures

Reliability Statistics

Cronbach's Alpha	N of Items
.941	42

ANOVA

		Sum of Squares	Df	Mean Square	F	Sig
Between People		246.975	18	13.721		
Within People	Between Items	127.278	41	3.104	3.823	.000
	Residual	599.341	738	.812		
	Total	726.619	779	.933		
Total		973.594	797	1.222		

Grand Mean = 3.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	144.95	571.497	.120	.942
Q2	145.47	561.596	.240	.942
Q3	144.89	563.433	.437	.940
Q4	145.00	541.222	.807	.938
Q5	145.00	559.667	.434	.940
Q6	144.79	556.620	.459	.940
Q7	145.11	566.766	.218	.941
Q8	146.16	563.696	.246	.941
Q9	145.37	568.801	.193	.941
Q10	145.53	554.152	.467	.940
Q11	145.53	543.930	.593	.939
Q12	145.11	557.211	.424	.940
Q13	145.42	562.702	.221	.942
Q14	145.79	533.398	.695	.938
Q15	145.21	550.064	.563	.939
Q16	146.11	537.211	.614	.939
Q17	145.58	540.702	.728	.938
Q18	145.16	544.140	.672	.938
Q19	145.32	551.228	.488	.940
Q20	145.26	558.649	.457	.940
Q21	145.11	559.766	.393	.940
Q22	145.47	549.708	.535	.939
Q23	145.21	558.509	.399	.940
Q24	145.58	548.257	.508	.939
Q25	145.84	539.251	.623	.938
Q26	145.32	551.784	.579	.939
Q27	145.74	540.760	.563	.939
Q28	145.11	537.655	.713	.938
Q29	145.21	554.064	.419	.940
Q30	145.42	550.924	.484	.940
Q31	145.79	520.175	.818	.936
Q32	146.26	535.094	.698	.938
Q33	145.58	561.146	.334	.941
Q34	145.63	531.357	.775	.937
Q35	145.47	537.374	.803	.937
Q36	146.32	546.784	.551	.939
Q37	146.21	530.842	.729	.937
Q38	145.95	522.386	.830	.936
Q39	145.42	552.702	.425	.940
Q40	145.58	573.813	.017	.944
Q41	146.11	569.211	.115	.942
Q42	146.11	539.766	.789	.938

APPENDIX 5 PUBLICATIONS AND RESEARCH POSTERS PRESENTED

A. Papers in Conference Proceedings

Conference Paper No 1: Fatokun, A., Akintoye, A., Liyanage, C. (2017) The Renegotiation of Private Finance Initiative Design-Build-Finance-Operate Road Projects in the UK. In Proceedings of the International Conference on Sustainable Futures 26-27 November 2017.

THE RENEGOTIATION OF PRIVATE FINANCE INITIATIVE DESIGN-BUILD-FINANCE-OPERATE ROAD PROJECTS IN THE UK

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Abstract

Government across the world have been procuring infrastructure projects through Public Private Partnership (PPP) because of its many advantages. The main advantage is the efficiency it offers regarding value for money (VfM). In spite of these advantages, the procuring authorities are faced with numerous VfM implementation challenges, which necessitate a swift shift to Private Finance 2 (PF2) in the instance of the UK. One of the significant implementation challenges affecting value for money is contract renegotiation. Its effect is more pronounced in the water and transport sectors of numerous countries and has become a subject of concern for the stakeholders especially the public-sector stakeholders. This background prompts the evaluation of the renegotiation of Private Finance Initiative (PFI) Design-Build-Finance-Operate (DBFO) road projects in the UK. An exploratory research method based on literature review and qualitative interviews are adopted. The findings reveal that there are instances of changes and renegotiation in PFI (DBFO) road projects to varying degrees. The case studies further show that road DBFO's are characterised by more changes to the contract than a renegotiation of the contract, and there is no evidence of adverse renegotiation impact on the VfM criteria identified by the respondents. Hence, renegotiation does not necessarily have to adversely affect the value for money criteria or result to non-achievement of VfM for the public sector as established by the literature. The ongoing research, therefore, advances and extend the findings of this preliminary research to other case studies towards proffering robust solutions to the problem of VfM achievement in PPP road projects renegotiations.

Keywords: Renegotiation, Changes, Private Finance Initiative, Design-Build-Finance-Operate, Road Projects.

Conference Paper No 2: Fatokun A., Akintola A., Liyanage C. (2017) Factors Leading to the Renegotiation of Private Finance Initiative (PFI) Design-Build-Finance-Operate (DBFO) Road Projects in the UK. In Proceedings of the 13th International Postgraduate Research Conference in the Built Conference 7-9 September 2017.

FACTORS LEADING TO THE RENEGOTIATION OF PRIVATE FINANCE INITIATIVE (PFI) DESIGN-BUILD-FINANCE-OPERATE (DBFO) ROAD PROJECTS IN THE UK

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Abstract

The renegotiation of Public Private Partnership infrastructure projects has not received public sector recognition because of the outcomes recorded over the years. The stakeholders involved in the renegotiation of the PPP road projects have adduced numerous reasons. In some instances, the reason can also be the factor leading to the renegotiation of PFI (DBFO) road projects. Thus, several factors inform the decision of the primary stakeholders to renegotiate the contract. This paper, therefore, evaluates and assesses the factors leading to the renegotiation of PFI (DBFO) road projects in the UK. Qualitative interviews involving both public and private stakeholders were extensively adopted on five PFI (DBFO) case study road projects to address the aim of this study. This serves to complement the findings of the literature concerning the factors leading to the renegotiation of PPP road projects. The findings of this research reveal the respective factors leading to the renegotiations of PFI (DBFO) road projects in the UK. However, the prominent factors are a change in scope of the works necessitating works removal and an addition of assets, change in standards and obsolete specification occasioned by the long duration of the PFI road project concession among others.

Keywords: Renegotiation, Factors, Private Finance Initiative (PFI), Design-Build-Finance-Operate and Road Projects.

Conference Paper No. 3: Fatokun, A., Akintoye, A., Liyanage, C. (2016) Factors Influencing the Renegotiation of Public- Private Partnership Road Projects. In the Proceedings: CIB World Building Congress in Tampere, Finland, 30th May to 5th June 2016.

FACTORS INFLUENCING THE RENEGOTIATION OF PUBLIC PRIVATE PARTNERSHIP ROAD PROJECTS

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Abstract

A critical evaluation of recent literature reveals that there is evidence of high incidences of renegotiation in public-private partnership (PPP) infrastructure projects, particularly in the road sector. These high incidences of renegotiations in road projects can be attributable to a number of factors, which influence the decision of the primary stakeholders to renegotiate the contract. Based on the premise of this prevailing situation in PPP road projects, this paper evaluates and assess the factors influencing the renegotiation of PPP road projects. An exploratory research method, which adopts a comprehensive literature review of PPP road projects was conducted to achieve the above. The findings of the study indicate that the factors influencing PPP road projects fall under the economic, technical, institutional, regulatory, contractual, administrative & managerial, political, social and environmental categories. The paper concludes by identifying the critical factors, which have the profound influence on the renegotiation of PPP road projects in their respective category. These factors fall under the design, regulatory, administrative, and technical factors in their respective order of literature prominence. The need for the development of modalities to assess and ensure the credibility of PPP regulation and proper estimation or evaluation of PPP road projects at the design, technical and administrative/managerial level was recommended to mitigate the negative influence of renegotiation.

Keywords: Critical factors, renegotiation, public private partnership, road projects.

Conference Paper No 4: Fatokun, A., Akintoye, A., Liyanage, C. (2015) Renegotiation of public-private partnership road contracts: issues and outcomes. In the Proceedings: 31st annual Association of Researchers in Construction Management (ARCOM) conference, 7-9 Sept. 2015, Lincoln, UK, Vol. 2, 1249-1258.

RENEGOTIATION OF PUBLIC PRIVATE PARTNERSHIP ROAD CONTRACTS: ISSUES AND OUTCOMES

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Abstract
The renegotiation of road projects has been an important issue that has generated concerns in PPP procurement over the last decade. This has had serious policy implications for public procurement policy across countries because of its implications for the achievement of the objectives defined at the inception of PPP road contracts. This paper assesses the renegotiation of Public-Private Partnership (PPP) infrastructure projects to identify the issues involved in renegotiation and its outcomes. Data were collected through a literature review of selected studies on PPP infrastructure projects on a sectoral basis with emphasis on Latin America, Portugal and Spain. It was revealed that a high proportion of PPP contracts in the transport sector are renegotiated: Indeed, in the transport sector, more PPP road projects are renegotiated than other forms of transport projects. The main factors surrounding the renegotiation of road contracts are: lack of an adequate contract design, frequent opportunistic behaviour on the part of both public and private partners during the implementation of PPP road projects, changes in the conditions affecting revenue and costs beyond the reasonable assumptions accounted for in the original contract, corruption, and political and economic instability, all of which in most instances reduce the chance of the public partner in achieving its objective of value for money (VfM). The paper concludes with a discussion of the need to develop a framework for integrating considerations of value for money into the renegotiation process of PPP road contracts. Keywords: public-private partnership (PPP), renegotiation, road contracts, transport sector, value for money (VfM).

B. Research Posters

Poster No 1: Fatokun, A., Akintoye, A., Liyanage, C. (2016) Overview of a Study into Renegotiation of Private Finance Initiative Design-Build-Finance-Operate Road Projects in the UK presented at the Annual Research Student Conference 2016 on the 8th September 2016.

Poster No 2: Fatokun, A., Akintoye, A., Liyanage, C. (2015) Integrated Value for Money Renegotiation for Public Private Partnership Road Projects presented at the Annual Grenfell Baines School of Architecture, Construction and Environment School of Postgraduate Student Research Event on 10th June 2015.

APPENDIX 6 EVIDENCE OF ETHICAL APPROVAL OF THE PROJECT

21st January 2016

Akintola Akintoye/Ajibola Oladipo Fatokun

School of Engineering

University of Central Lancashire

Dear Akintola/Ajibola,

Re: BAHSS Ethics Committee Application

Unique Reference Number: BAHSS 320

The BAHSS ethics committee has granted approval of your proposal application ‘‘Integrated Value for Money Renegotiation for Public Private Partnership Road Projects". Approval is granted up to the end of project date* or for 5 years from the date of this letter, whichever is the longer.

It is your responsibility to ensure that:

- the project is carried out in line with the information provided in the forms you have submitted.
- you regularly re-consider the ethical issues that may be raised in generating and analysing your data.
- any proposed amendments/changes to the project are raised with, and approved, by Committee.
- you notify roffice@uclan.ac.uk if the end date changes or the project does not start.
- serious adverse events that occur from the project are reported to Committee a closure report is submitted to complete the ethics governance procedures (Existing paperwork can be used for this purpose, e.g. funder’s end of grant report; abstract for student award or NRES final report. If none of these is available use e-Ethics Closure Report Proforma).

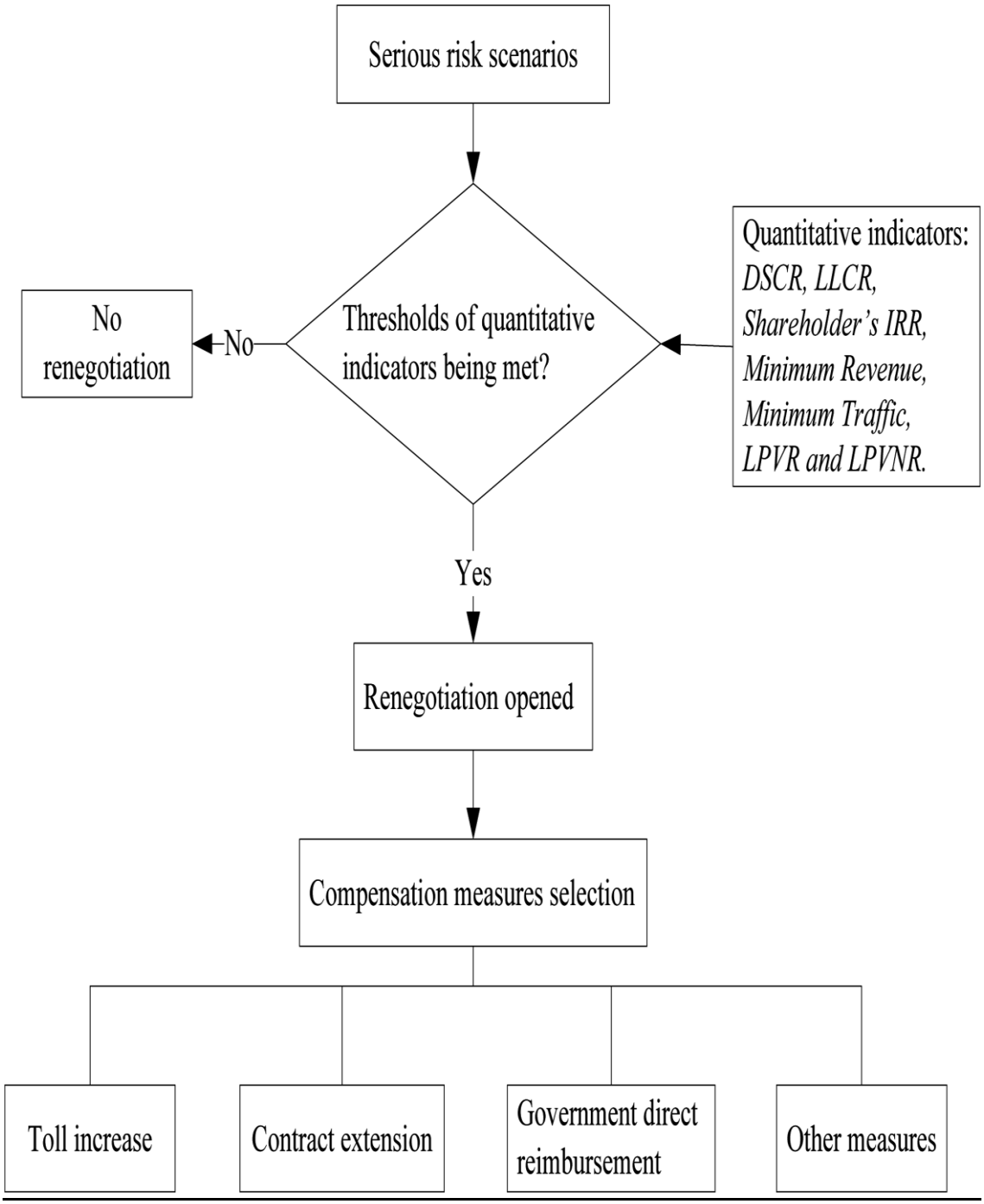
Yours sincerely,

Nick Palfreyman

Deputy Vice chair

BAHSS Ethics Committee

APPENDIX 7 GENERAL CONCESSION RENEGOTIATION FRAMEWORK (GCRF)



Source: Xiong and Zhang (2014)

APPENDIX 8 COMPARISON OF RENEGOTIATION RULES IN SELECTED MARKETS

	UK Standardisation Of PFI Contracts Version 4 (2007)	Germany- Model Contracts	Germany- Actual Project Contracts
Variation Rules	**Rules Differentiated according to value:** • small (output oriented) option. • Medium (input oriented). • Large: tender, expert, or benchmarking	Negotiation based on contractors cost estimate	Frequent negotiation clauses. In some cases, options or tender requirements
Dispute Resolution	**Three stage process** • Negotiation within the project with higher hierarchy levels • Expert resolution or other form of non-binding alternative dispute resolution • Contractually defined time limits for individual stages	**Three stage process** • Project advisory board by the parties • Conciliation arbitration (typically no recourse to courts) • No time limits for individual stages	Clauses typically identical with model contracts
Termination	**Authority** • Voluntary termination with compensation based on market value or parameters from financial model. • Authority break points with contractually defined compensation amounts as option	**No Authority** • Voluntary termination right in the contracts • Recourse to (vague) contract law provisions	**Typically no authority** • Voluntary termination right in the contracts • Sometimes, authority break points

Source: Berkers et al., (2010)

APPENDIX 9 AXIAL CODING OF THE PARENT AND CHILD NODES

Nodes

Name	Sources	References	Created On	Created By	Modified On	Modified By
contract renegotiation	8	33	11/11/2016 12:47	SN	13/11/2017 22:21	AO
Reasons for Renegotiation(Reneg Influe	9	20	16/11/2016 16:08	AO	13/11/2017 21:32	AO
Initiator of Renegotiation	9	18	16/11/2016 16:37	AO	13/11/2017 21:24	AO
Need for Renegotiation Criteria	9	22	16/11/2016 20:06	AO	13/11/2017 21:26	AO
Incidences of renegotiation and changes	9	39	16/11/2016 16:41	AO	13/11/2017 21:16	AO
Impacts of Renegotiation	9	28	16/11/2016 16:23	AO	13/11/2017 22:03	AO
Implications (Outcomes of renegotiation	9	50	16/11/2016 16:24	AO	13/11/2017 21:45	AO
Value for money	7	22	16/11/2016 16:11	AO	13/11/2017 22:00	AO
VfM Recommendations (Solutions)	8	53	16/11/2016 16:25	AO	13/11/2017 22:01	AO
Stakeholders VfM satisfaction	9	28	16/11/2016 16:30	AO	13/11/2017 21:50	AO
Strategic VfM actions in renegotiation	9	43	16/11/2016 16:33	AO	13/11/2017 21:58	AO

APPENDIX 10 TRANSCRIPT OF THE INTERVIEW ON RESPONDENT XY6-PRI ON CS4

Date of the Interview: 21-09-16 **Start Time:** 13:23 Hrs - 14:39 Hrs

Name of Respondents: XY6-Pri

A. Preliminary- Respondent's Details

Q1. Me: Can I have your position on the project?

XY6-Pri: There are two parts to the organisation. I think I told you the other time. We've got the concession company which is the auto link, and I am the General Manager, and there is a contract between the Autolink and A19 ROM contract which is the Routine Operation and Maintenance who is also Sir Robert McAlpine. There is a contract between the two, and I am the General Manager of the two arms. So, I am having an agreement with myself. Me: So, you are acting on both spheres. XY6: Yes. So, that's my position. I'm the general managers of the two companies.

Q2. Me: What sector are you?

XY6-Pri: Private sector.

Q3. Me: What's your academic/professional background, please?

XY6-Pri: I have a bachelor's degree in Civil Engineering, and I am a Chartered Civil Engineer with the Chartered Institution of Civil Engineers.

Q4. Me: What's the location of the project?

XY10: Dishforth to Tyne Tune Tunnel is the full extent of the project. Ehm. But we are here in Billingham. That's the location.

Q5. Me: Do you have an idea of the estimated cost of the project?

XY6-Pri: The project cost £935 million.

Me: That's the total contract sum.

XY6-Pri: Yes

Q6. Me: What's the current stage of the project?

XY6-Pri: We are 20 years into the 30 years concession. As the contract, we needed five core requirements, which we try to be completed within the first three years. We have completed four of those and the fifth one which is the T via duct structural refurbishment. We agreed that we could extend that. So, it will be completed in 2024. We've completed the first three stages, for stages 4 and 5, we've just combined the programme for that, and it will be completed by 2024.

Me: What is the reason for the extension?

XY6-Pri: Because the majority is the demolition and replacement of the piers and via a duct. When we assess the structure, we saw that the structure was in dangerous condition as was thought at the time of the tender. So, we decided that we do demolition and replacement in a sort of phases along the period. That will enable to get the benefit of improvements in Technology, Basically, like I said a lot of things can happen in 24 years and the client the benefit that in a 30-year concession. A lot of the work is signed and like I said they would get the renewal at the end of the job.

Q7. Me: How many years has the project been on and what's the contract duration?

Me: You answered the 7th question. "We are 20 years into the 30 years concession". So, I don't need to go into that.

XY6-Pri: Yes.

B. Assessment of the Implications of the Achievement of Value for Money (VfM) As A Result of Renegotiation in Private Finance Initiative (PFI) Road Projects

Q8. Me: What aspect of this project undergoes some changes or renegotiation?

XY6-Pri: When the contract was signed in 1996, the standards were locked in into 1996 standards. Ah once we did the five core requirements. We then took up the responsibility of maintaining the road as it is. We are not here to improve any further than the five core requirements. We will maintain as it is.

Me: What are the core requirements, please?

XY6-Pri: The core requirements were to build a new not on the pathway improvements which was £48 million improvements which were a widening of the north and south of T via a duct. Widening from Geo 2 lane to Geo 3 lane. That cost £48 million. We built that, and it was completed six months early and within budget. The second core requirement was to carry out refurbishment unto a tilting bridge which was a major crossing at the river Sunderland. That work was completed, ahh, the T via duct refurbishment which I talked about earlier will be completed in 2024. Fortifying and assessment of structures and that was completed, and the other ones were to install two emergency telephones north of the T side area. At the south of the T side, there is already a telephone installed, and we installed them all. That's the five core requirements.

Me: So out of all of them we have about three completed now, only one is still left to be completed?

XY6-Pri: We've got one which is yet to be completed, and that is the T via a duct, and it is expected to be completed in 2024. The contract ends in February 2027.

Me: Out of all the core requirements. How many core requirements do you renegotiate or change?

XY6-Pri: As I said we are locked in the 1996 standards, what we said to Highways Agency right at the start of the contract was that if you lock with the contract deed the standards of the contract. If you continue maintaining that road, i.e. that section of the network to the 1996 standards. In 30 years', time, at the end of the concession, what effect will you have to be in place? Because of standard change. The contract allows you. There is a mechanism in the contract which can introduce change by additional works. There are two mechanisms in that. The client which is the Secretary of State for Transport can introduce change and renegotiate those changes if he wants to. And there is a mechanism for us to promote change and the secretary of state will pay for that change. And there is a mechanism for us to introduce change where if we promote the change we will identify what needs to be improved. We will put a business case forward for doing that, and as part of that improvements, we will be ahh ensuring targets which will be safety performance targets. When the DBFO was changed, if we built it at our expense and we didn't achieve those targets, we won't get paid. So basically, we don't promote improvements. If we work on the roads and we identify issues, we will report all those issues to Highways England or the secretary of state for transport, and he will say what he wants to do with it because obviously, the risk for the DBFO contractor will be too high. So, as it is. If you have a section of the road where you have a very bad junction that wasn't performing very well, and you have a lot of accident that you could see that by minor improvements you could get positive benefits. Yes, we would. In this case, those opportunities were very few.

Me: So, in this case, there are changes in standards.

XY6-Pri: Yes, changes in standards and, we introduced those changes in 2009 and we negotiated it with Highways England to modify the contract to introduce the change in standards.

Me: So, the request was made by you?

XY6-Pri: So, as we said, it was in our interest to have those changes. Secretary of State for transport who works for Highways agency then. They recognised that. So, we sat down and

renegotiate those change which we called the *"Enhanced service"* That was instructed in 2010. So, we implemented that in 2010. Also, as I said as part of the operation, we monitor the performance of the road network. If we identify any problem areas, we will put a case to Highways England who represents the secretary of state. They will then consider these issues and apply for funding and come to us to tell us if it is something they want to do and ask us to do that and pay us to do it. We are now into 17 years into the concession, and there has been a total of 200 changes to a value of about £70 million additional works that we have been instructed by the client, and we have successfully introduced those changes.

Me: Thank you very much

Q9. Me: At what point in the life of the project does this changes or renegotiation occur?

XY6-Pri: It's a 30-year contract, and we are now 20 years in. The contract will finish February 2027.

Me: And when do you affect the first changes and renegotiation.

XY6-Pri: The first additional works notice that was issued, the contract started in February 1997 and the 1st change Ahh will probably be in the year 2000.

Me: And what does it border on?

XY6-Pri: I can't remember, it was just a small improvements scheme. I will find out a list of that, and I will show you what they involve. They are small improvements altogether. As I said, improvements. It can vary from few hundred pounds to few thousand pounds. As part of the renegotiation with Highways England, if the work we identify is less than a hundred thousand pounds, then they will ask us to do the work based on the rate that we have given them. Anything above a hundred thousand pounds can go out to the market place and get competitive tenders. And we will be invited to tender as well. Highways England says that now because we have been here for 20 years and because of the reputation we have. They are looking to increase that from £100, 000 to 1.5 million pounds. Anything up to 1.5 million, they automatically give us and ask us to price to do the job. Again, as I said over the 20 years, we have established a reputation where we can perform, work and provide VfM.

Q10. Me: Why do you renegotiate this contract?

XY6-Pri: Why we did it. Again, basically as I say it is because standards change.

Neil: Ahh again we passively say practically regarding the signpost. So standards change now, and signpost has to be collapsible and exactly at the end of the contract we have to provide the same signpost regarding VfM deliverables. But they pay us extra money to provide the passively safe sign post. That's just an example. Me: OK.

XY6-Pri: So, regarding the change in standards. In 2010, when we included the enhanced service from 1997 to 2010, there have been 400 changes of standards.

Me: On this project?

XY6-Pri: Nationally.

Neil: In the design manual, the Highways England have said a lot of things about that. They have spoken about the standards that superseded the previous standard as a result of the change.

Me: So, the standard changes from time to time

XY6-Pri: Yes, the standards for us are reviewed and new technology ahh and basically when they consider the standards they look at the new technology introduced and have a look whether they provide VfM. And the Highways England do that on behalf of the Secretary of State or Department of Transport. And they will review those standards and ascertain whether introducing those standards will produce a safer road for the travelling public and provide some sorts of VfM for the taxpayers. That's what is done.

Me: Okay.

Q11. Me: Who makes the renegotiation request in this project instance?

XY6-Pri: As I said there is a clause in the contract, as the DBFO contractor, we suggest the change and promote the change because to pay for the change, we don't do that because it's too much risk. What we do is that part of our contract is to do the routine operation and maintenance of the project road. The project roads consist of 20km. 585 link Kilometres and 197 bridges of structures. Now we monitor by various sort of inspection machines services undertaken on an annual basis. We monitor the condition of the road. We monitor the safety, we monitor the traffic, and we monitor the accidents, traffic incidents on the network. We report that. As part of that, we analyse what leads to road traffic incidents, and you identify problem areas, and we will make the point that out to Highways England. Ahh and then discuss with them about undertaken feasibility studies. So, we do the more detailed analysis of what the problem is and come up with a solution to solve that problem. So, it's working as a team with the client. We are doing the operation and maintenance. We monitor the roads, and we report the incidences and suggesting ideas of how that situation can be improved.

Me: Ok.

Q12. Me: Regarding results of the renegotiation, what are the outcomes of this renegotiation instances regarding the cost and other deliverables etc.?

XY6-Pri: Ehm, we would identify the problems, and the Highways England will do the study. We will identify the options to solve a problem. And you will then choose the option which produces or gives you the best VfM. We then provide Highways England with the price to undertake that work, and it's a fixed price. So, as part of that price, we will include a risk element. Se we price. What we've done is that we have a list of things that could go wrong. We do it very much in an open book, and we show Highways England what the prices are before we do the detailed breakdown of that cost before they could instruct the work. They can come in and carry out the audit whenever they want. The checks that have been done because of our quality system and our management systems. We have all the steps in place, and we make sure that the work is done correctly. As we work very closely with Highways England as the client. Then since we started the contract, we promote very much collaborative working. As an organisation, we have certification to BS 11000 which is the collaborative working. Ehnn which foster good relationships, we got that three years ago and we had just received a renewal of the certificate last month. We very much work as a team with the client right from the start of the contract, we work very closely with them.

Me: What's your opinion on the cost of the concession so far? Are you on the budget?

XY6-Pri: Ehn. I think DBFO provides VfM. Because saying that. If we want to carry out the maintenance strategy, we undertake the highway network. That highway network will wear out. It hasn't got an infinite life. It has a finite life depending on the traffic and its usage and the wear and tear. If you develop the right maintenance strategy where you invest the money at the right time and you carry out maintenance at the right time. Then you get the VfM. DBFO contract allows you to do that over the 30-year contract period. So, we've invested strongly because it's our money. We've been very proactive for example on bridges where a lot of problems caused by salt water attacks concrete. Ehn, we on our stretches, we've got a drainage system in place to stop the water getting into the concrete. We have got waterproof bearing shells, appropriate draining systems on the runway and that helps sort of stops the deterioration of bridges. So, our bridges all over the period. If you maintain and do the necessary, the standards are upheld, and the conditions are improved. Ah we are now 20 years in and the condition of our network is very good. That's recognised by Highways England. And it's recognised nationally because people are commenting on the condition of the road. Some said that the condition is best kept maintained throughout the country. Because we carry out the works at the right time. PFI allows you to do that because you have priced to do the job and it is your money. The problem with the traffic compared to the rest of the network is that their condition is monitored and each road you must

bid for money to carry out whatever works that are identified. And they don't necessarily get the money. Now an example is the carriage way. If your carriageway is showing you signs of distress like wear. You go and do the work. It could cost you. You could get away with resurfacing and you must go 10 years or 8 years later resurfacing. If you don't do that work, then the deterioration isn't linear. So, let's say it cost you X million pounds to maintain that road. If you wait and go beyond the period, you can end up doing the job three or four times what it would ordinarily cost you. And that's what happens on roads which are financed by the public purse. Because they've got to bid nationally, and it cost a lot of money. And because we've got a thirty-year window. We've bid for that and we've made the decision that we are going to maintain that road properly and to the right standard and put it in a very good condition. The issue is that at the end of the concession. After the end of the thirty years. That goes back into the purse of the national body where you don't have to start bidding for money. So, what's going to happen on A19 is on our project road is that there will be a look at what the condition is i.e. Eh look A19 is in an excellent condition where all the zones or routes are in proper condition and target the money to routes that are in poor condition. If the standard level of the wear and poor condition is, then there will be an assessment of where the national average wear condition is. And in a very short period, A19 is going to go down. And within five years it's going to just be back to where it was thirty years ago. So, they've lost thirty years investment.

Neil: So, regarding how the country's economy is performing, the secretary of state commits Autolink to pay the plan to allow them to get the money back on the investment for the responsibility of maintaining the road network. And the rest of the road network is safe if the economy dives. There will be cot cutting within the government because those are not getting their money at the right time.

Me: Then, will that have an impact on the job regarding the time,

XY6: We've decided at the early stage in person that the road should be maintained to the right quality. Do not serve the assets as it poses a significant risk. It's like you are looking at the whole life costing and some DBFO contract will say I am going to do that work and I am not going to anything within ten years and 15 years. And they've done it. Indeed, we have a lot of DBFO contract that is not far from here, and they go to the same for construction. Ah, so 18, 16, 17 years. So, if we maintained that road at the right level and did the surfacing, etc. It would not mean the situation is worse. Apparently, he's made that decision. In its whole life costing analysis. He's looking into the amount of big pot of money that we are going to spend now which will mean that in the next few years we are not going to spend another big pot of money. And at the end of the job, I might have paid another big pot of money. What we have said is that we are not going to do that because there is a significant risk in that. What we will do is that we will spend the money at the right time. So, you send that money out. So, we send that money out into those assets, but we discovered that we had incurred cost earlier on. So, you must start looking at the net present value by projecting your cost forward and earning them back, but I still think we will even need to show how our methodologies are better.

XY10-Pri: You also get the efficiency in the way the work is done. We do our work at night because we get lane closure charges if we take the road out of operation during the busy period of the day. Now because the road is maintained regularly, interventions are less intrusive, so we can do the work at night and open the road network the next morning and it's safe for the road users to use. If you go in full to use the road for construction, that increases the cost and ultimately reduces the VfM.

XY6-Pri: If you don't spend the money at the right time. I think a good analogy is that if you've got a house with a wooden window when completed. Ah you paint them, then you go in every five years bring those windows down and re-paint them, they last forever. You put a window in and leave them, in twenty years they will be fallen out. That's the same. It's carrying out the right maintenance at the right time. And that gives you a far better VfM.

Q13. Me: Is there any difference between the VfM achieved at the point of renegotiation and the VfM defined for implementation?

XY6-Pri: Right at the start of the DBFO contract, there is quite an innovative form of contract which is something that has never been used before. We are in phase 1 and what was looked at was that there is quite a lot of risk. It was a significant risk, and that was priced in the contract. Ah, again what we looked at was that we priced that risk. We didn't know we will price the risk which allows us to win the contract. Again, by carrying out the maintenance, coming out with proper maintenance strategy and maintaining the road to that standard, then that risk will disappear very quickly. The more you reduce that risk and carry out the maintenance the more profit you make.

Me: So, you experience that on this project.

XY6-Pri: Yes, Yes. Because we carry out the work properly, we've got a road that is in good condition. We've made significant savings from what the original budget was.

Q14. Me: Is there any evidence of achievement of VfM for your organisation on this project?

XY6-Pri: Yes

Me: So, you achieved VfM on the project.

XY6-Pri: Obviously at the time of the contract, when the contract was awarded, it was seen by the department of transport that it was VfM because we have achieved what was in the tender. But we as an organisation because we maintained and managed the property. The tender that we predicted has improved. And again because of the efficient management and the efficient way in which we operate.

Q15. How would you describe stakeholders (i.e. public sector, SPV and users) satisfaction regarding VfM achieved on this project?

XY6-Pri: Highways England has changed their philosophy about how they maintained the network regarding the assets led and regarding developing the maintenance contracts. And they have a deal which runs for the rest of the network that they called the maintenance agent contract. That has been run for the duration that we have been in place. When DBFO first started, they saw that as risk as well. But in the seven years that it's been operational. But the way we work, the way we operate because it's thousands of pounds that we will be spending. Ah and we don't waste money, and we're are on a marked contract and are out to make as much money as we can. So, if its resurfacing that has been identified to be done, He doesn't want to go as twice as the length of the contract to do the resurfacing. And the experience of the last ten years. We make sure that the job is done correctly, and we make sure that the job is done at the right time of the year. And that's all that it all be. And the rest of the network has been done based on the way the money comes in. And we've got a situation during the year where the work does not necessarily give you value for money. Where we make sure that we do the work at the right time of the year. We make sure that the work that is undertaken is of the right quality and that gives you further than the whole life costs at the end of the period.

Me: Regarding the users, do you have their opinion with regards to satisfaction.

XY6-Pri: Ehn, again we get a lot of compliments from the way the road operates. We have customers request service which was set up to monitor customers service and complaints. But nowadays we have more compliments than complaints which reflect how we perform on the A19 DBFO road project. Also, where nationally traffic growth is slow and gone down, ours has been increased because people recognised A19 has the primary north-south road parallel to the A1 and people know that if you go on the A19, you are not going to be held up by roadworks. We have an efficient incidence support unit so that if there is an incident on the network, we get there and clear it up quickly. People choose our network rather than going to experience the A1 and what I will tell you is that our traffic growth has increased over the years steadily and the rest of the road network has gone down.

Me: And that's evidence of the satisfaction derived by users

XY6-Pri: We considered that person who makes that request will use the A19. As I said, we have got a customer request service which has provided a lot of complement which the Highways England has asked us to pass those complement to them because it is a significant boost for them

Me: And to you as well equally.

XY6-Pri: Yes, Yes.

C. Assessment of guidelines and measures to ensure the achievement of value for money at renegotiation of PFI (DBFO) Road Projects

Q16. How do you define strategic VfM targets in PPP road project concessions phases? Are there any targets set for VfM at the inception of the contract?

XY6-Pri: All other DBFO contracts have, but we have not. They have got targets for payments. We get paid based on the level of traffic using the road. But another DBFO contract has objectives based on the speed of traffic, travelling on the network. We have a situation where if we take a lane out or get a road closed, we get charged. We get penalised for it. Now at the start of our contract, we have an allowance in our budget of about 26 million GBP for lane closure charges.

Me: Is it per day or?

XY6-Pri: For the duration of the contract, 26 million GBP. So, we set this out every year to take care of the possibility of what Highways England is going to charge us if we go out to close a lane for a single day.

Me: Are the charges per day or year?

XY6-Pri: It is per hour. For every time we take a lane out, we get charged per hour per kilometre per lane. So, it is tens of thousands of pounds per year. On the T viaduct. If we take any road out in a day, it will cost us 100,000 GBP for lane closure charges. Now as I say, we currently have nothing for lane closure charges because we have introduced a method of working where we don't ensure lane closure charges.

XY10-Pri: What that means is that there will be benefits to road users.

Me: I think the road users pay for using the roads.

XY6-Pri: No highways England pays a shadow toll for every vehicle using the road.

Me: Some other DBFO roads do not pay based on the number of vehicles using the roads. Why?

XY6-Pri: It's just the way that contract is put together. Some of the charge on the average speed of the traffic. This is just to indicate that you are not causing any disruption. Well, ours is only lane closure charges. But at night we don't because there is no traffic. So, we develop techniques where we do the job at night. I think last year we got lane closure charges of about £30,000 which we deducted from the original budget for lane closure charges.

Q17. Me: What are the VfM targets that are usually defined and documented in PFI (DBFO) road projects?

XY6-Pri: Basically, in any business, you look to make sure profits. That's what we target. We have a target set by the company and organisation, and we achieve those targets.

Me: What about other targets regarding cost, duration of the contract, quality etc.

XY6-Pri: Again, all of our contract. We are now in the routine, operation and maintenance. All of the contracts like the resourcing contract, we will programme that. We will work collaboratively with our specialist sub-contractors who will help us in the planning of the works. We plan those works so that we don't incur a loss. What we will do is we will look at can we do it during the day. And we will look at if we do it during the day what lane closure charges will be incurred. So, we price that, and we price that which will be incurred during the night. So, if you are doing it during the night, it will cost you more to get materials. It will cost you more to get

labourers etc. So, you get the balance but 90% of the times you arrive at the fact that it pays to do the work at nights. We price the options, and we come up with what is the best option.

Me: I think that answers that. And regarding other DBFO road projects in the UK, do you have an idea about the target that is set for VfM.

XY6-Pri: No idea. As I said, some of them had got speed, average speed as the basis of payment to the concessionaire. Some also use the critical incidence on the network as the KPI, and they get charged in a situation where there is incidence on the network. So, every DBFO contract is different. Even the early contract. We have the contract that was priced. We had some contracts after the pricing that went down to the preferred bidder. And after that was announced, there was nearly a year negotiation between the clients and the concessionaire as certain things were brought in and certain things were taken out to achieve the objectives.

Me; So, I see from all your explanation, VfM has been achieved on this project?

Q18. Me: Ok. I see, then what are the main procedures you take in measuring the success regarding VfM achievement?

XY6-Pri: We will measure as far as I am concerned and the contract aside, the level of profit we make. We will also look at the cost of collaborative effort we're making because without collaborative measures i.e. a fully integrated team. We work closely with the supply chain. We know from them again that the major ones we have what they called cost basis. So, we know what profit they are targeting.

And so, the cost process is an open book. So, we see their cost to know that they are making their profit and so we work together as a team so that everyone comes out with what their objectives are. There is no right work as a partner, and then he is found losing money. And then if you are working with someone as a team and he is losing money. Then he has problems. Because he will be concentrating on the way he could do, cut corners and the way he can do to recoup the loss in every situation. So basically, it's short-sightedness to look for ways to screw money out of them. So that is to give them a fair reward for the fair money they have paid. And if you get that, you will get VfM because you make what you intended to make. So, if you've got a sub-contractor who is not performing. He's not making his money. Then you have got to make sure that there is extra management. And you guys are working seriously to make sure that the quality of the work is right. So, we very much work as a team when we work so tightly together as a team to make sure that all the objectives are met. Now as far as the programme is concerned. The measure is the level of disruption. Now we plan the programme that there is minimum disruption to the public. We make sure that we don't earn lane closure charges as far as possible. Because the level of lane closure charges is being assessed on the impact, you are going to make on the travelling public. So, if you put a lane out and there are about 90,000 vehicles a day who use that. You put a road out then the queues will be 5 to 6 miles very quickly. Putting a lane closure at certain times during the day allows some traffic to flow through. So, when the charges are high, the charges reflect the level of disruption to the network. So, the measures that we have is that the lane closure charges that we pay are the minimum. Also, another measure for us is that within this contract, the client has the right to penalise, he can issue us with penalty points. If we don't perform, we can be given the penalty points. And if you get to certain level of penalty points, the client will try and bring their management team in to charge us the cost of doing that. There is certain level after that points after which he can terminate the contract. We have got no penalty points. The last penalty point was issued in 2001, and that's 16 years we have not had any penalty points. Me: That is a good one.

Q19. Me: Do you think it is necessary to define criteria for renegotiation at the inception of PPP contract?

XY6-Pri: I think you try and plan your contract, what you want to do and how you want to do it. If you want the job carried out, you put measures in place. Like I said, Lane closure charges and disruption. And getting the contracts and paying for the service required. The contract that is providing the service, you have an allowance for them with regards to them with regards to profit.

And performance to be merged against that level. So, you wouldn't necessarily tell the contractor or tell the clients the profits you are making. Now we do, any additional work that we do, we will show Highways England that we've priced a job, we'll give them a cost breakdown which will show the profit. So, they know what we are charging regarding benefit.

XY10-Pri: When we do additional works per hour. They know the rate per hour that we charge per day for each member of staff in getting things done.

XY6-Pri: In some contracts basically, they know the mark-up that we charge on the cost. If for example, it is £5,000 we put 20% on the sum and so on and so forth up to 10% profit on the contract sum. So, 10% is quite a low figure. Most organisations are working on at least 14% - 15%.

Me: So, from all what you have said now, so there are criteria for renegotiating the contract?

XY6-Pri: So, we can negotiate a change to the end of the contract, we can negotiate a change in extension of the contract. That's the current point in time we've been told it will not happen. Because of the original OJ notice that was published in 1995 did not say anything about an extension. Therefore, they say that to sit down and negotiate an extension wouldn't be legal.

Me: So, it was not allowed in the contract?

XY6-Pri: Yes. That was 20 years ago. That was not considered. And they are now saying they can't do it. They could do it because if they feel there are any objections from other contracts in any part of the industry. The way to do it is to announce now ten years out. That they are starting negotiations with us to extend the contract and if they do that they will get a feel if anyone is going to object.

Me: Because it was not envisaged at the beginning of the contract. If we do the or if we now start because at the end of the day, it is a contract between two parties and both parties agree. Therefore, we could do whatever we want with the contract. So, If I announced it. I made an official announcement that they agree. So, you could do whatever you want with the contract. So, if I announced it. Made an official announcement that it will be in the taxpayer's interest or the public interest to negotiate or whatever it was, the contract completion or the management of the contract completion. The negotiation was to extend the contract by five years and see what reaction or outcome we get. And if nobody reacts. Then we can't just sit there and say it's too complicated. That's what happens when you have got a contract and are working with the government. Ah, it gets to the point where it's too complicated.

Q20. Me: What are the guidelines adopted for assessing PFI road projects renegotiation regarding VfM achievement?

XY6-Pri: Basically, the same. We have five core requirements for the contracts which have to be completed. That is set within the contract for the years and duration. It's still ongoing but that was negotiated with the client after that, it's just to carry out the operation and maintenance. Ah, we have hand-back requirements, and negotiations for achieving hand-back requirements begins five years from the end of the contract. That programme was set in, and you must sit down and negotiate that programme as well. Discussion about hand-back requirements started about ten years ago. It is not a primary concern because if you adopt the right maintenance strategy which we don't. Been proactive in carrying it out. All the titles and monies are there. The problem is you don't roll them over if you don't invest in it a year. Then you have got five years to fix it. And that was the reason because if you carry out the maintenance and you put maintenance strategy couple with 5- year hand-back requirements, the road will be in good condition. So, there is an arrangement to look at this at least five years from the end. As I said, we have been looking at it, planning it and tried to negotiate with them (the client) because some of the things in the contract were manageable. We cannot do what the contract asks you to do. It's impossible. That was pointed out 15 years ago, and we submit a common ground on it. They have a problem

Me: So, this hand back requirement has helped in sustaining the value of the project?

XY6-Pri: Ehn, Yes.

Q21. Me: Has the guideline helped in achieving VfM or otherwise on this project?

XY6-Pri: Ehn Yes.

Q22. Me: Please describe the criteria and modalities for the identification, measurement and recording of the VfM achieved at strategic renegotiation points during the PFI road projects renegotiation?

XY6-Pri: Like I said any improvements and additional works, we give a fixed cost eh. Fixed priced sorry. And Highways will pay us that. Ahh. Then we are paid no more than that. We priced that. With regards to the maintenance side of it, we have a maintenance strategy developed at the start of the concession which also established and provides the price of the job. That is reviewed every three years. Basically in 2004 when I did my first project plan. For that three years, there is a fundamental review; you are looking at everything from the start again. Ahh, and on top of that, you should look at the annual programme, two-year programme and five-year rolling programme. We have a 30-year project plan which gives you what you want to spend for that period, and every three years you review that. But then you have also got at the end of every year; you look at what the work that was planned. What you have achieved. If you have deferred action, that goes back. If we have a five-year programme and that rolls. So schemes are brought forward, and schemes are extended. So, it's constantly monitored as you go through to ensure that you are achieving based on because you have a series of inspection and visual surveys and all that is increasing the data or providing the data of the condition of your assets. And that's done annually. So you are continually reviewing the state of your assets and then and you look at each scheme within that 30 years and one year and roll it.

Me: So, we can call all these contractual mechanisms designed to control or ensure VfM.

XY6-Pri: Yes

Me: You have mentioned fixed cost. Is it measured in terms and against the financial model monthly?

XY6-Pri: Ah, we have a financial model for the project that is constantly, and that is based on the price of the project plan and what we do is we work on that project plan. Ah again, we have the 30-year project plan, and within that, you look at your income, your outgoings and your cover ratios. We should include that cover ratio in case anything goes wrong. So, you should look at the cost and that gap. So, you look at it so that you never overspend. So, if you manage the property, you should never be in a position where you are drawing down outside the project plan. So, we have never had to do that. Of course, we have always done it the other way. Or it was not just carrying out work. We don't think work needs to be done so that they put it on the structure. Then like a way year or before that. We don't take that money out of the plan, it stays in the plan, and it goes into the next year. Then the money will remain in the purse of the bank. So, we have significant reserves to cover any of the likely cost that makes that plan.

Me: And do you have changes to the costing month because of the contractual criteria established for payment mechanisms?

XY6-Pri: Ahh, Payment mechanisms is set at the start of the contract. So, we get paid for every vehicle that uses the road. Now the payment that you receive is a based year. So, for a car, this year you may get a penny, the next year you might get 2 pence. The way that structure works if you start the project, you look at you look at the overall maintenance strategy, what you are going to spend when you are going to spend it. You look at the whole cost profile. Then basically it ended up going down and down. The payment, the tolls that they are paying you will sort of put in place to shadow life.

XY10-Pri: So, to estimate the number of vehicles you have got to count your revenue over the next year. And that is what you get paid, and then there is a reconciliation at the end of the year against the actual traffic.

XY6-Pri: So, that is how the model came and the final value. At the start and every year, we measure traffic. At the start of the year, we make a prediction based on last year's traffic figures. What the next 12 months' traffic is going to be. That enables the client to pay us money with shadow tolls throughout the year. And at the end of the year, you do reconciliation. So, if your traffic increases massively that year. At the end of the year, you negotiate what the actual traffic is to what you predicted at the beginning of the year. If it is over that year than what you anticipated, then they will pay you extra. And if it is less, they will expect you to spend that money back.

Me: Do you have any payment condition bonus such as journey time reliability bonus, safety performance adjustment, critical incidence bonus on the road. A proactive management bonus and also investment decision approval process.

XY6-Pri: No.

Me: Okay

Me: Some regard it as contractual mechanisms that are designed to measure VfM.

XY6-Pri: Yes, they have safety measures. Like I said the only one we have got on this contract is lane closure charges. And again, we manage the network as lane closure charges could be massive and we could hit the profit. As I say, last year we don't incur it. In all our work, there is no disruption on the road network.

Me: That is the reason why you experience a boost in profit in a bit

XY6-Pri: The problem is safety measures. When we talk of safety measures, we look at comparing the roads. The expense is random events and that the problem we have got with trying to promote improvements as a DBFO company. Because you will say I will pay for this improvement and I will say if there are no accidents in the first year or the first three years whatever the contract said. We will say x number of accidents. So, if I invest X number of pounds on improvements. You are investing in something which is a very high risk. So, it implies that if there are six accidents or five. Then I have just lost a million pounds.

XY10-Pri: So, there is a noticeable safety problem that could be fixed by specific measure. Highways England could do through additional works anyway. Because they will. Rather than pay us the bonus, that is quite an obvious solution. They will instruct the work, and they will pay us the cost of doing it. They sane in themselves the safety bonus which they don't have to pay us. And something less than this, that will become a big risk, and we don't want to take that risk.

Q23. Me: What method or technique do you adopt in the evaluation or calculation of VfM variance occasioned by PPP road project renegotiation?

XY6-Pri: No variance.

Q24. Me: What do you think could be the strategic actions that can be taken to address deviations from the VfM targets defined at inception and the VfM achieved at the end of the renegotiation process?

XY6-Pri: I think it is working as a team, recognising that everyone has shared aims and the way the contract is formed. We have got lane closure charges, which ensures that there is minimum disruption on the network. One of those things that we have done and again as I said our traffic has grown. That to me is a sign that we are getting it right. I don't want to be there forcing traffic to use other roads. I want to be there doing what we call minimum disruption on the network. The other operators are causing mayhem and are transferring that to us. So basically, it is competent management, recognising what the aims and objectives are.

XY10-Pri. So, in our network, we rely on diverting traffic to other roads. We meet with well-developed authorities regularly. We have a good working relationship. They understand why and why we need to do it and they accept it.

XY6-Pri: Yes. Neil's points are a very valid point. In another area in the MARK contracts outside the DBFO. Highways England set up what we called Network Boards, and the idea is that in the network board you have single management from the Highways Agency than to the main contractor who met on a regular basis to talk about the day to day running. It is more about the overall strategy. What could they do to provide a better level of service? What they could do of course is something like the minimum level of disruption to service provision. What happens could be what happens to all other contractual issues. It is a recognition of the fact that we have set up the network board which is not part of our contract and not part of things, but we try and take that strategic view. One other thing is that when Highways England set up the network Board, they are just looking at purely the network. You cannot operate that network without the local authorities. So, the network board should have representatives from the local authorities to take strategic views. We will liaise with the local authorities. Now if we want to close the road, the best way to do the work is to cause minimum disruption to the public. Ah, they allow us to divert the traffic of the A19 onto the other network and vice versa. If they have a problem, they will come to us, and we will work with them or help them out to overcome their challenges. So, we work on a much more of a strategic view of the whole road network, and that's what the problem is and to make it up publicly you can't just look into your length of road in isolation. You have got to have an appreciation of the rest of the network which is all in the connects and you got to think about the overall management. How you manage them. That's VfM.

Q25. Me: OK. Any other recommendation for achieving VfM at the point of renegotiation in PFI road projects, please?

XY6-Pri: It's all about working relationships. Are we going down such that we have a proper partnering in force? Ehn, collaborative working such that we have partnered in force. If we choose correctly, there is going to be a benefit for everyone, and that is how we work. We have got a team now. We work as a team; we work together to the mutual benefits of everyone within the team. So, we keep this person as there is no difference between the guys working there and the ones doing here. We have got guys that have been there since 1996. We train our guys, we pay them well, and we look after them, and they get the best help, the best care and the best PP and the best training that anyone offers. And this guy understands that. If they want to go anywhere else. So, having that stable team is essential. Therefore, they become more committed to performing because they want to be here because of the motivators available. So, it's building up the whole team that may be able to work together maybe because they have the right reward for the effort. And if we go the award of a contract for the price. Then they become contractual. We have supervised another contractor working on the A19. But the contracts that were supposed to take six months now turn out to be one and a half. So, it's been an absolute nightmare, well you could do it in such phases on how not to manage a contract.

Me: You have mentioned about hand-back requirements, you have spoken about project plan reviews etc.

XY6-Pri: Yes. You have got to do that. By doing that is also the methodology of how you want to award the contract. The fifth edition is very adversarial, and there is a form of agreement that tries to take that out of the contract. So, some have better success than the other. So, you get the contract where everyone is the same name and the client recognise that the contract is going to make a profit. And the contractor knows that he has been paid to provide a service to deliver that. Once you get that, you start putting in every opportunity to screw in everybody, and they will ascertain if you are going to get VfM in the long term or not. We are in a day when you used to go out for the tender. Ah, we have a contract that will warrant the lowest price. Win it, and the first thing we did was two contractors and said we gave me a price for doing that work within ten percent reduction. Ah, his won the contract on any amount right at the at the start of the deal. So, everybody that is involved must look at how to optimise the cost that has been awarded for the

job. There is, therefore, contractual claims at one time when the department of transport look at the contract and they were saying that the out-turn of tenders is 22-23% higher than the bid. Now, that was the comparison that was made. What comparison they should have made was pretender estimate was and what the outturn cost was because the find out the public view will be 5%. So, if that were the correct contract estimate, contractors would come in there to getting here and going there. And that was what they did; they concentrated their effort in two years to get that price. Let me win the contract when I get in I then build up the cost through renegotiation. That was the opportunistic idea of some contractors. I will then put materials in and anything it could cost.

XY10-Pri: They pay contractors on time because in some less scrupulous contracts. They pay contractors on time. It's part of their strategy to keep the money not to pay them at the initial stage. So that when they have got that money they will leave the project.

XY6-Pri: The contract always works. They present the bill. Some contractor will sit on it for ninety days before anything happens and after ninety days the contractor says I have put my invoice on it and I have been paid. Alright, I cannot understand that. Why, when we have a look at that and on another five-six days. You give the theme phone calls. So, after three phone calls up to the third calls, they will look at it and process it. So, by then, it will be over 100 days whereas we pay within 28 days. So, on receiving the bill, we pay them on time. And now we achieve it within 20 days and again subcontractors that are with us because they know that they get paid. If you are in a business and you haven't got cash flow. Then you are not going to be in business for long. You could have a profitable business, and you may be making a lot of profit, if you have not gotten cash coming through the door, you may not be in business long. If you have not got cash coming through the door, you will not be in the business long.

Q26. Me: OK. Regarding this project, so far, you can say the changes made haven't affected the contract cost?

XY6-Pri: Yes, Yes, As I said, we've crossed the risk. At the time of tender, there was a significant risk. That was reflected in the pricing of the contract. So, we put people in place to manage that. Therefore, those risks seem to reduce considerably. Ahh, that's one of the issues say where you talk about negotiations at the end of the contract, one of the options that the client could have. He could come and say rather than finishing in 2027 due to my overall national management. If you accept, I could turn this contract to 2025. OK, if they come and ask us that, it will cost them whole lots of money. Because we have had all the risks and now we are now in a position where we understand what the cost is going to be. And although we are not going to give them any money back, we are going to make a profit for those two years, and our income is going to add the earnings for those two years. So, in fact, it might cost you more. If we have done it at three years into the contract after the new build has finished, then they might be able to sell it back at a reasonable price

Q27. Me: In the next few years do you see any difference or changes in the contract cost and does the contract makes provision for that?

XY6-Pri: Ahh, primarily as I said there is a project plan which is renewed every three years. Those things do change. The geo-technologist is brought in; you will have an adverse winter. Then you can have a quick deterioration of parts of your assets. So, we look at that, and we review that every three years. And basically, that will consider anything that will change within that three years. Some of them are like the cost of bitumen.

Me: So, because of that review there could be an amendment to the cost and time?

XY6-Pri: Yes, there is provision for that

Me: So that's part of the reason why you achieve VfM on the project?

XY6-Pri: Yes, Yes. It is. There is an indexation within the contract which guards you against some inflation, and there are increases.

Q28. Me: So, when do you propose to complete this project?

XY6-Pri: February 2027.

Me: Thank you very much for the audience. I am very grateful. Could we please have a photograph?

XY6-Pri: Yes, Yes. You are welcome. Best regards.

APPENDIX 11 VALIDATION INTERVIEW QUESTIONS

A. <u>Preliminary Question</u>

1. Please tell us your years of experience, qualifications, nature of work and company details.
2. Are you aware of any framework/instrument that has been developed that will assist in the evaluation of the renegotiation of PFI (DBFO) road projects for VfM achievement?

B. <u>Evaluation of the Relevance and Ease of Understanding of the Framework</u>

Could you please rate the framework based on question 3 and 4 on the following scales? (4 = Very High, 3 = High, 2 = Average, 1 = Low)

3. To what extent do you think the framework can be understood regarding the sections concepts flow from Section 1 to 5 and in terms of the construction logic?
   4 = Very High ☐ 3 = High ☐ 2 = Average ☐ 1 = Low ☐
4. To what extent do you think the framework has covered remedial actions that can be taken to address any observed deviation from the VfM defined at renegotiation?
   4 = Very High ☐ 3 = High ☐ 2 = Average ☐ 1 = Low ☐
5. Are any of the contract payment mechanisms, which has also been referred to as contract mechanisms for VfM achievement e.g., critical incidence bonus, lane closure charges etc. adopted as the measure (s) to ensure the achievement of VfM for users?

   Yes ☐ ☐ No. In the case of your project, which one is applicable?
6. To what extent do you think the contract mechanisms for VfM achievement indicated in (5) above have assisted in VfM achievement for the users?

C. <u>Evaluation of Applicability and Usefulness of the Framework</u>

7. Can you please assess the applicability and viability of the framework for the evaluation of renegotiation in PFI (DBFO) road projects for VfM achievement?
   4 = Very Applicable, 3 = Applicable, 2= Moderately Applicable, 1 = Slightly Applicable
8. To what extent do you think this framework would be needed and useful in the evaluation of VfM at the renegotiation of PFI (DBFO) road projects?
   4= Very Useful, 3 = Useful, 2 = Moderately Useful, 1 = Slightly Useful
9. Which of the following stakeholders do you think will find the framework most useful?
   i. Public Clientii. ii. Private Concessionaire
   iii. Both client and concessionaire iv. Users
10. Any conclusive suggestions or comments to improve this framework, please?